FIRST IN THE FIELD

Offshore

The Marine Oil OPERATIONS Journal

LOUISIANA OFFSHORE LEASE MAP In This Issue

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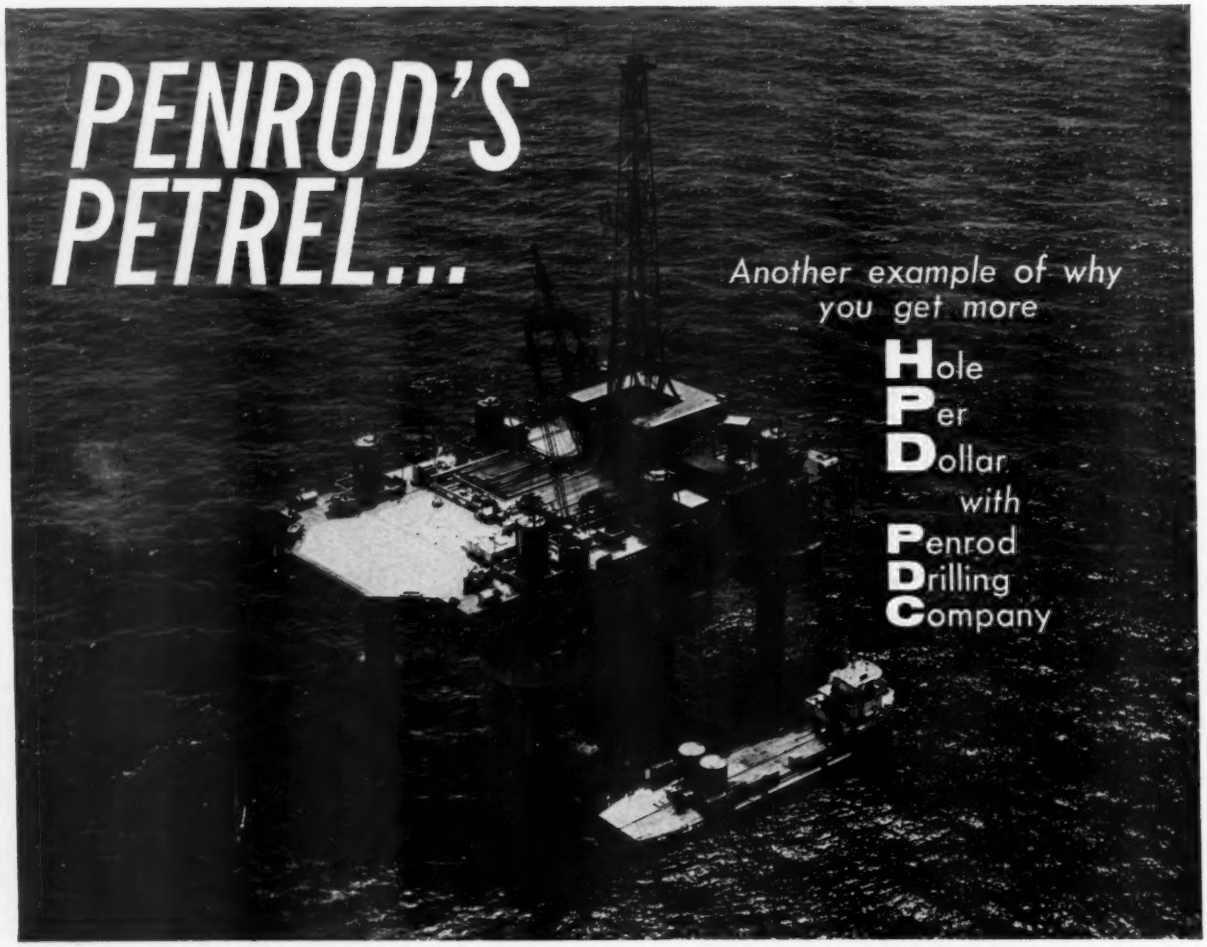
Fifty Cents FEBRUARY, 1959



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from Cleaver-Brooks Special Products, Inc.

CAPSULE REPORTS AND INFORMATION ON THE PRODUCTION OF FRESH WATER FROM THE SEA

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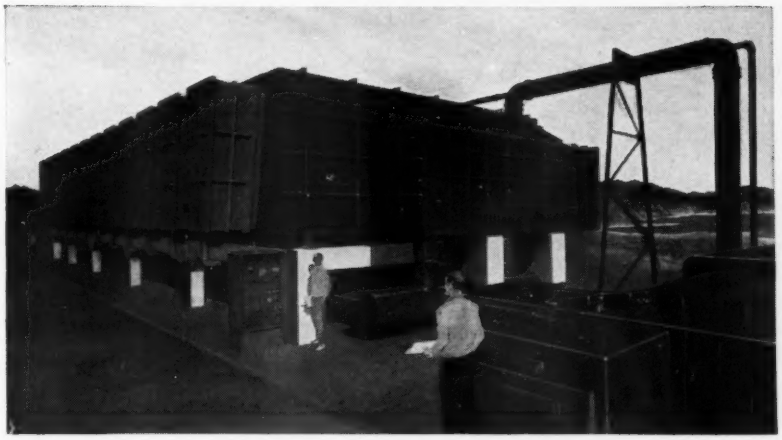


One and one-quarter million gallons per day sea water distilling plant. (Designer's concept)

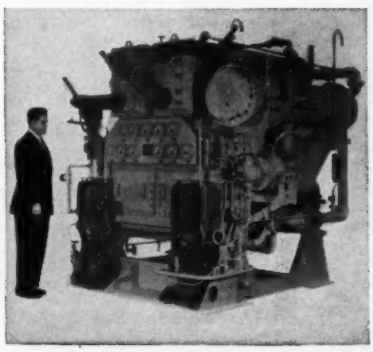
Waukesha, Wis. — Company engineers report additional progress toward reduction of cost of fresh water from the sea using flash evaporators of conventional design.

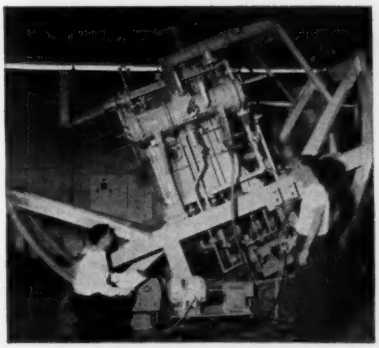
A typical study of a large municipal plant (the heat source is extraction steam from a turbine generating station), including all transportation, erection, storage, interest, insurance, amortization, fuel, power and maintenance, etc., shows a fresh water cost of about $1.00/1000 gallons based upon 20-year amortization, 8.5¢/gallon fuel and not including distribution. With lower fuel costs or waste energy as a heat source the cost of water may be reduced ½ of the above.

New developments on the drawing board anticipate further reductions of 15 to 20% as possible. Detailed studies can be made for any sea-side community and inquiries are invited.

NEW GUIDED MISSILE DESTROYERS GET CLEAVER-BROOKS FLASH EVAPORATORS

The Navy's latest guided missile destroyers, DDG 4, 5, 6, 9 and 14, to be built at the New York Shipbuilding Corp. and Todd Shipyards, will be equipped with Cleaver-Brooks Flash Evaporators, capable of supplying each ship with 24,000 gals. of fresh water per day . . . flashed from the sea.





"ROCK AND ROLL" TEST FOR SEA-GOING EVAPORATORS

This tester developed by Cleaver-Brooks rocks a flash evaporator as much as 45° from horizontal to prove its efficiency under actual shipboard operating conditions.

The illustrated model is presently at the Cleaver-Brooks sea-side testing laboratory site in North Carolina where a series of tests is being run to investigate performance and cost-reduction improvement.

The rocking fixture was the first of its type and is available to check the effects of a rolling sea on any new design improvements before they are incorporated into production models. Continual improvements are expected to keep Cleaver-Brooks far ahead in the sea water evaporator field, and laboratory testing facilities are being rapidly expanded.

SPECIAL ANNOUNCEMENT: In keeping with its continuing expansion the Special Products Division of the Cleaver-Brooks Company is now a separate corporation with the name CLEAVER-BROOKS SPECIAL PRODUCTS, INC.

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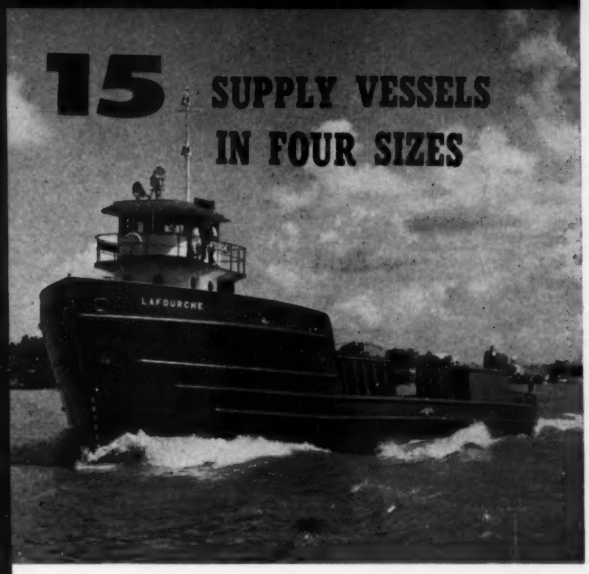

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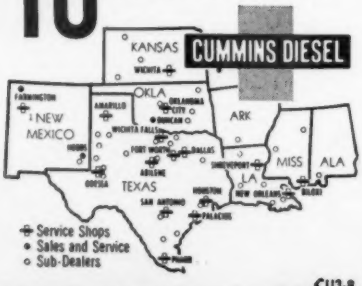

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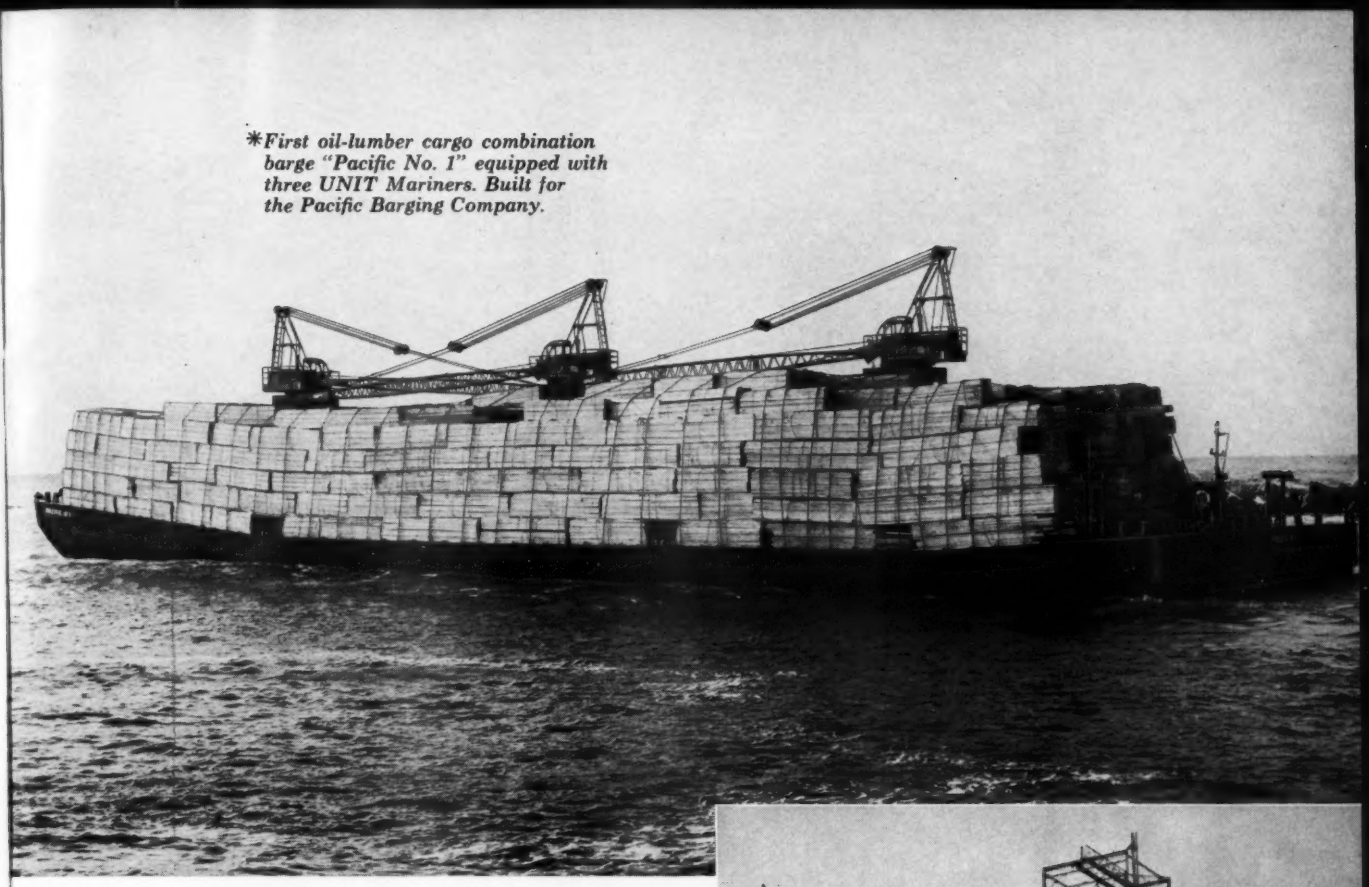

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Way offshore . . .

With the Publisher

This month, we're doing something we don't do very often—publishing an article from another magazine.

"The Evolution Of Salt Domes" appeared originally in Gulf's OIL-MANAC, under the title, "Salt Of The Earth." We found it fascinating reading. And it suddenly occurred to us that there were probably a lot of other jiggers like us around the oil patch — characters who'd maybe punched holes around salt domes without quite knowing how the saline monoliths, as they're called in the article, got there.

So if you're ignorant like us—read about it!

Me'n Red Shibley, of Marine Service Company, are better educated than some folks. We took our wives to New Orleans last week-end, and now we know the horses that didn't win. Trouble is, we can't figure out how the information will help us—now.

You know, progress is something that's pretty hard to measure. But I've got a measuring stick.

When I was a tow-headed youngster of seven, my family moved from Tinnie, New Mexico to Spur, Texas, in a covered wagon driving a little bunch of horses. We averaged maybe 15 to 20 miles a day. Took something like a month to cover 400 miles.

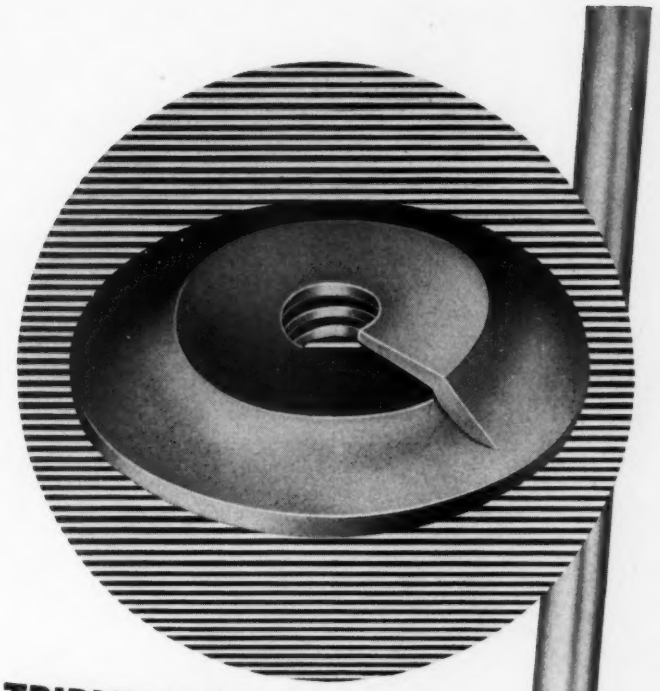
When we were in New Orleans, we dropped by to visit Trowbridge Sebree, who's a chief pilot with Capital Air Lines. His wife used to work for OFFSHORE.

To make a long story short, an Eastern Air Lines pilot who was also visiting the Sebrees pointed out that while the wife and I were driving back to Conroe—in about seven hours—he would fly to Houston, back to New Orleans and then to Houston again.

Seven hours to cover three times the distance we covered in a month in a covered wagon! So on that hurried note, we'll . . .

See you next month!

Long John Latham



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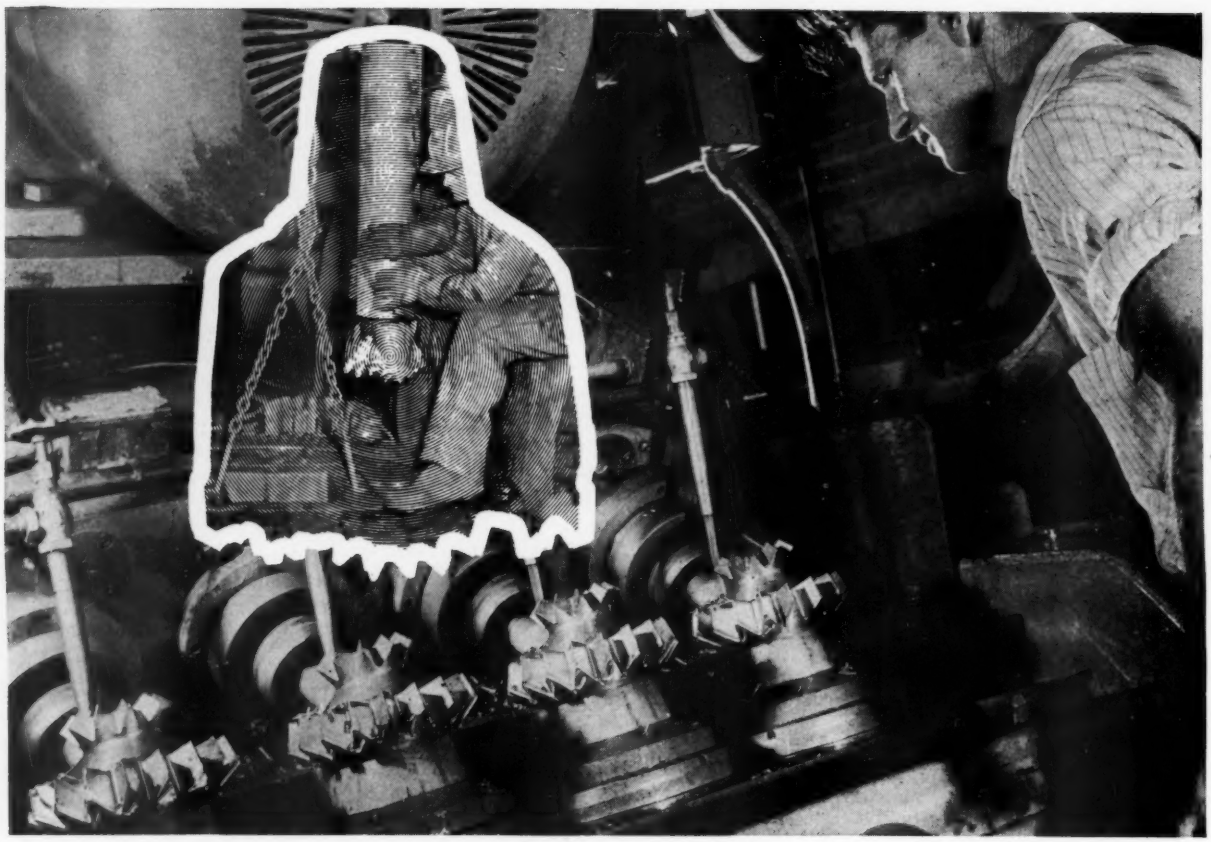

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Offshore
Vol. 10, No. 1 February, 1959

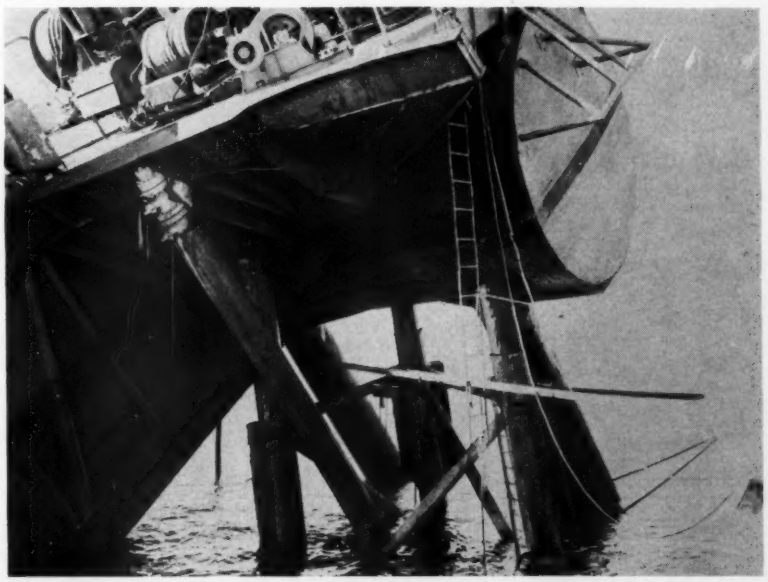
Rig Capsizes In Gulf

Storm chokes are credited with shutting in dually-completed well, averting possible marine holocaust

With its desk awash in wintery seas, the giant drilling rig above listed at 30 degrees in the Gulf of Mexico for several days, then capsized in 35 ft. of water. But salvage crews were optimistic about rescuing the rig—and the owners and operators of Trans-Gulf **Unit No. 10** could give fervent thanks that storm chokes had shut in the well after the tree had been knocked off and the well started blowing wild.

Six of the 38 men aboard were injured—three seriously enough to be hospitalized. But had the well not been shut in quickly, the accident might have turned into a marine disaster similar to the recent CATC offshore fire in which several lives were lost.

How it happened . . . Early last month, **Unit No. 10** finished drilling Well No. 8, State Lease 1423, a dual completion in Block 21 of Louisiana's South Timbalier area for Gulf Oil Corporation. While owned by Trans-Gulf Offshore Drilling Com-



WING TANK OF RIG rests on twisted wellhead structure. Tank and skid truss were cut away to free the structure. Top, crude oil is washed from rig as salvage operations get underway.

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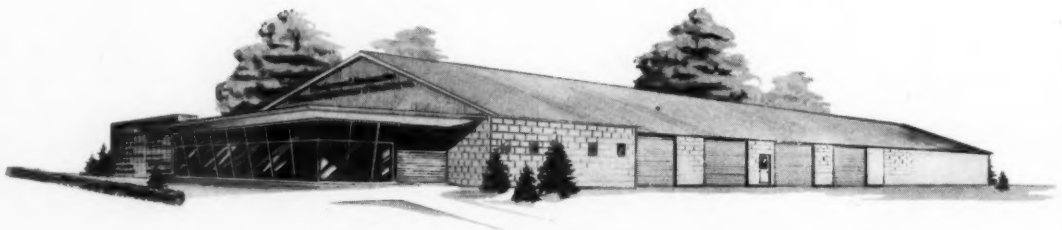

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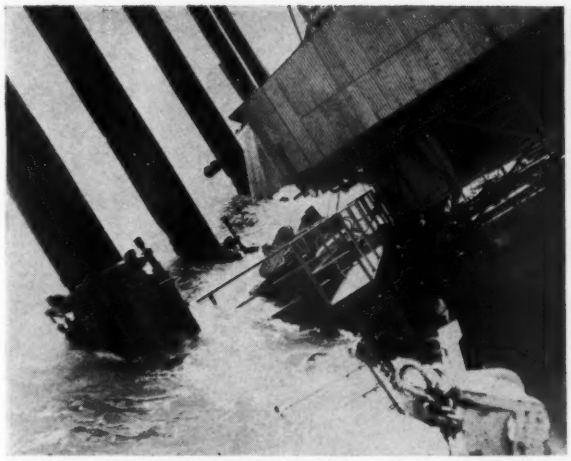

SEAS BREAK OVER DECK of listing marine drilling rig. Location is Block 21 of Louisiana's South Timbalier area.

pany of Houston *(See Offshore, April 1958, p. 42)*, the rig was being operated by Reading & Bates Offshore Drilling Company of Tulsa.

At 4:30 on the morning of January 10, the platform was being lowered preparatory to moving to a new location. The hull had been lowered approximately four feet when the rig suddenly started listing.

Within 30 to 40 seconds, **Unit No. 10** had careened to starboard approximately 30 degrees—so quickly that a service company representative was injured as he slid downslope in the recreation room against the starboard bulkhead and the furniture slid atop him.

Well blows wild . . . As the rig tilted, a wing tank knocked the Christmas tree from the wellhead structure. The wellhead structure and conductor casing were twisted to one side.

Immediately, the well began spewing oil and gas. A stiff north wind, blowing from dead astern, swept the oil forward, spraying the derrick and superstructure of the rig.

Storm chokes . . . But the well blew for only a few seconds, according to men aboard the rig. Then the storm chokes, set at about 3,000 ft., took over and shut the well in.

Salvage operation . . . Two derrick barges were rushed to the scene. To stabilize the rig and keep it from listing further and perhaps capsizing, six additional piling was driven, three to the side. The starboard wing tank was cut away to free the wellhead, and the wellhead structure and conductor casing were straightened. There was no apparent additional damage to the well.

Two more positive storm chokes were set—one in each string.

Salvage attempt . . . To refloat the rig, Reading & Bates planned to sever the 12 legs by detonation (each leg is an individual piling support, operating through wells in the barge hull). But heavy seas forced a layoff on January 20, and on January 21 the rig tilted further and capsized in the stormy Gulf. It lay on its side, partially submerged.

Soil failure . . . Subsequent investigation has developed the cause of the accident as a foundation soil failure. There was no structural or mechanical failure, according to expert opinion.

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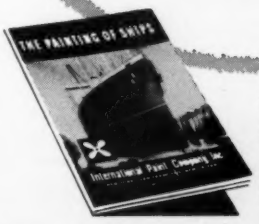

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Drilling to Increase in 1959 Industry Experts Predict

From 50 to 60 rigs will be operating in Gulf

The offshore oil industry and its suppliers are looking to an increase in drilling operations during 1959.

One industry official predicted that the number of offshore rigs operating in the Gulf of Mexico will range from 50 to 60 compared to an average of 40 last year.

Off California, where several wells were brought in last year, drilling will continue to expand.

One of the biggest contributory factors is the expected increase in domestic demand—4 to 5 percent over the 1958 level. Top industry experts calculate that domestic consumption will rise about 430,000 bbls. per day over the 1958 level. The demand increase, combined with cessation of inventory liquidation and adequate restraints on imports should permit domestic crude oil production to increase about seven percent.

The total wells drilled onshore and offshore this year is expected to hit 53,000. During 1958 there were 49,000 wells drilled.

Supply companies are optimistic, as exemplified by United States Steel's Tennessee Coal & Iron Division, largest steel producer in the south and southwest. Arthur V. Wiebel, president, pointed out that the corporation is so convinced of the economic health of the nation that it is continuing to make a considerable investment in modernization and improvement of its plants.

Rainey Elliott, president of Jones and Laughlin Supply Division, said, "We are not predicting a boom year for 1959 but several factors appear to favor a decided improvement from 1958."

Alaska

Second Kenai Peninsula Find Flows Oil From Two Zones

Alaska's first commercial oil field on the Kenai Peninsula has another discovery, a dual completion by Standard-Western and Richfield Oil Corporation.

The deeper pool discovery is Swanson River Unit 2. The interval at 10,804-10,878 ft. flowed at the rate of 500 bbls. per day of 30-gravity oil through a 24/64-in. choke. The interval at 11,038-11,060 ft. flowed at a daily rate from 360 to 480 bbls. of 29-gravity oil.

Britain

Eel-Like Device of Fabric Recovers Lost Oil at Sea

Oil spilled in the sea can now be collected by an eel-like device drawn by a motor launch.

Shell Petroleum Company, Ltd., is the owner. The oil is surrounded by the boom and then recovered through the boom's suction pipes.

Invented by a Norwegian, the boom is made of plastic-coated linen strips about 150 ft. long and 3 ft. wide, stiffened with aluminum rods. Lead weights at 3-ft. intervals keep the boom's lower edge deep enough to prevent any escape of oil even in rough seas.

California

Three Wilmington Groups To Unitize for Repressuring

Operators of the Wilmington-Long Beach field have agreed to spend more than $42 million to restore original underground reservoir pressures to the Long Beach Harbor area.

Fault Block four producers recently agreed to unitize that sector through an $18,394,000 water injection program. Sixty-three injection wells will be used to pump 557,000,000 bbls. of water into the ground at the rate of 305,000 bbls. per day.

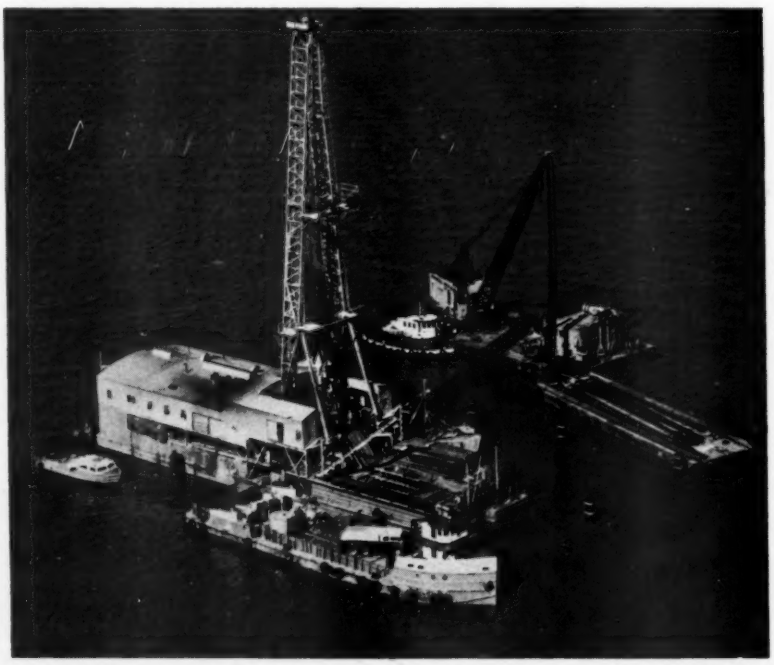
Fault Block two and three operators are already working to complete a $23,795,000 repressuring program which will pump 710,604,000 bbls. of water into the ground.

Tidewater Moves Its Offices Into New $10 Million Building

A new $10 million building on Wilshire Boulevard in Los Angeles, California, has become world headquarters for Tidewater Oil Company.

Tidewater was founded 80 years

(continued on page 16)



A PIONEER DRILLER in Louisiana's offshore oil fields has begun its first wholly-owned production in Main Pass Block 46 field where this barge is drilling the seventh well 64 mi. southeast of New Orleans. Although Magnolia was the first to drill out of sight of land in the Gulf, the firm sold part interest in its early holdings.

Reading & Bates Offshore Drilling Co. looks to

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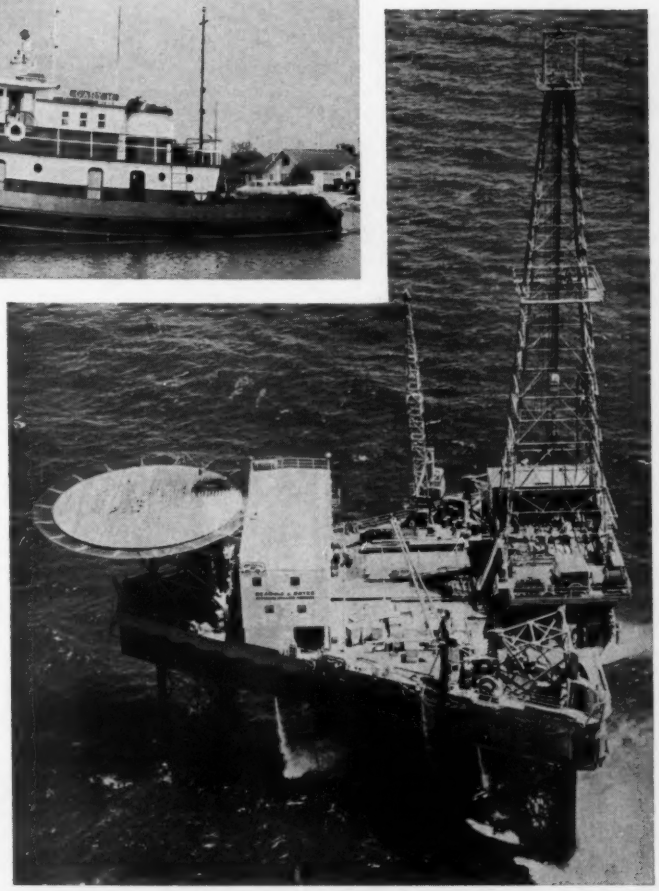

No offshore towing job is too big or too difficult for the powerful towing fleet of Nolty J. Theriot, Inc.

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News . . .

(continued from page 14)

ago by three independent oil producers who built the world's first long-distance oil pipeline over the Allegheny Mountains to the tidewaters of the Atlantic.

Previously the main office was located in San Francisco and New York.

Firm Pays Santa Monica $50,000 To Preserve Pact

General Petroleum Corporation recently paid the City of Santa Monica, California, $50,000 to extend its tidelands drilling contract.

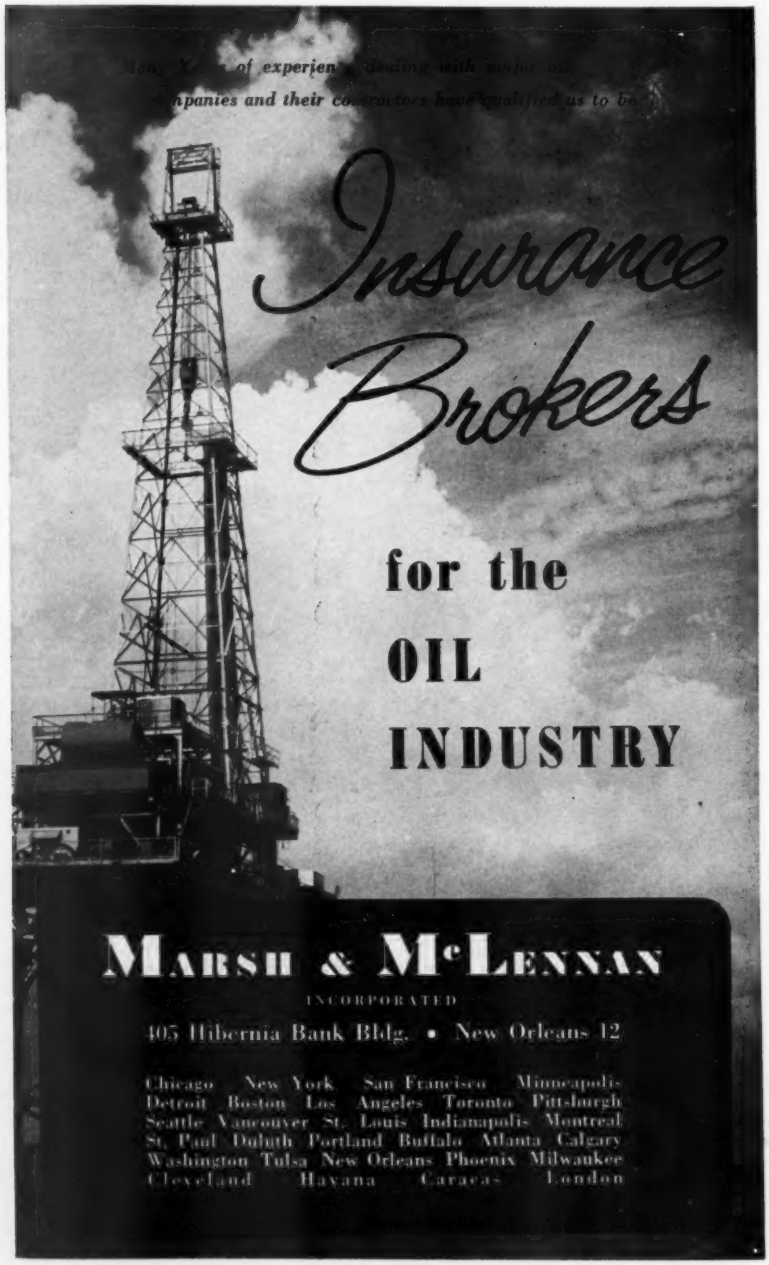
As a result of competitive bidding, General Petroleum acquired the right in 1954 to drill for oil and gas under the tidelands controlled by Santa Monica. The company paid a bonus bid of $500,000 which was placed in trust for the city until the city's voters chose to repeal the drilling ban.

Each year until the ordinance is revoked, G. P. must give the city $50,000 of the original $500,000 to keep the agreement in force. Santa Monica citizens have thus far refused to revoke the ban.

Richfield to Drill Wildcat Offshore at Coal Oil Point

Richfield Oil Corporation will soon drill a wildcat well off Santa Barbara County's Coal Oil Point. Already the location has been staked for Richfield-Honolulu-Signal-State No. 309-2, and a drilling barge will soon arrive.

Considerable exploratory work has been done in the area by Richfield. Richfield continued as operator after assigning interest in the lease to Signal Oil and Gas Company and Honolulu Oil Corporation.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Louisiana

CATC Completes 173-Mi. Offshore Microwave Link

CATC Group's newly-completed microwave system in the Gulf of Mexico will link CATC drilling platforms off the Louisiana coast and production offices onshore.

The 173-mi. system includes seven offshore stations and four onshore stations to be maintained by three Continental Pipe Line Company employees. Future plans provide for telemetering facilities and remote control of production.

Lines to Move Offshore Gas To East to Cost $40 Million

Texas Gas Transmission Corporation will build $40 million in new pipelines to bring offshore gas from the Gulf of Mexico if a proposal by Hope Natural Gas Company is

"Wow, Hensly!...You do have a delicate touch!"

approved by the Federal Power Commission.

Hope proposes to deliver up to 100 million cu. ft. of gas per day to eastern markets using its own offshore production, supplemented by reserves in the West Cameron area purchased from a group made up of J. Ray McDermott, Inc., Phillips Petroleum Company and Kerr-McGee Oil Industries, Inc. Hope has five wells in Block 4 of the East Cameron Area.

Plans are for Texas Gas Transmission to gather the gas and transport it to Lebanon, Ohio, where it will be picked up by Texas Eastern Transmission Corporation and carried to Hope's lines.

In readiness for the program, Texas Gas Transmission will build 246 mi. of new pipeline.

Nigeria

New Submersible Drill Barge To Reach Nigeria Early in '59

A submersible drilling barge used in shallow inland waters will be delivered to Shell-BP Development Company in Nigeria early this year.

The Dutch-built barge which can drill to 14,000 ft., will be used for work in the coastal swamps, which Shell-BP has made pay off with three oil discoveries.

Persian Gulf

Another New Mobile Unit To Be Towed to Persian Gulf

Another mobile unit will swell the tide of offshore vessels bound for the Persian Gulf.

Mobile Unit No. 56, built by American Bridge Division for The Offshore Company of Baton Rouge, Louisiana, has been bought by Pan American Petroleum Corporation.

The new rig will drill its first well in the Persian Gulf on a concession off Iran held by Pan American International, a division of Pan American Petroleum.

Contractor in Persian Gulf Will Draw $9500 Per Day

International Drilling Company of Holland will get $9500 per work day when they begin operations in the Persian Gulf Neutral Zone about April 25.

The two-year agreement between International Drilling of The Hague and Arabian Oil Company, the Japanese firm which has offshore rights in the Neutral Zone, calls for payment on a work-day basis.

International Drilling's equipment including a mobile drilling platform, the **C. E. Thornton,** a tender, a transport vessel, and a workshop all left Orange, Texas, December 24 and are scheduled to reach the Neutral Zone early in April.

Two Pipelines in Persian Gulf Will Cost $20 Million Plus

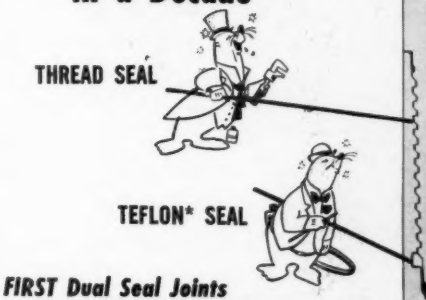
More than $20 million will be spent on two pipelines to be laid beneath the Persian Gulf.

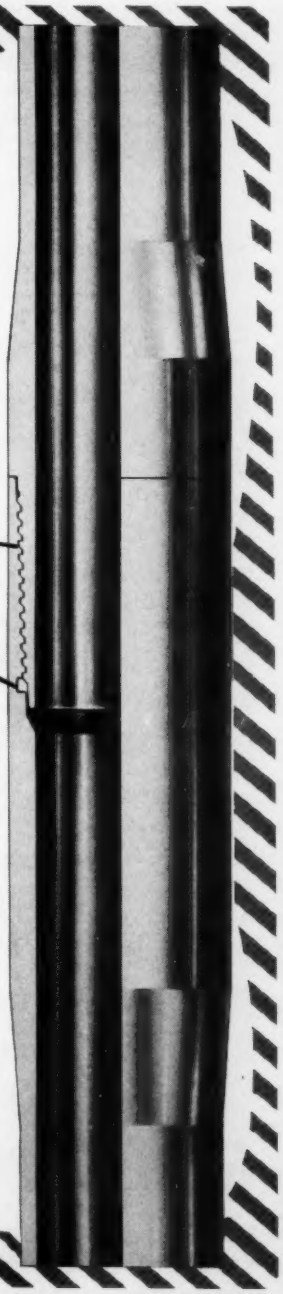
International Marine Constructors, C.A., an affiliate of Collins Construction Company, will lay 25 mi. of 30-in. line for Iranian Oil Exploration and Producing Company. The line will carry crude from Ganaweh,

(continued on next page)

H-G — NEW LEADER IN TUBING JOINT ENGINEERING FOR HIGH PRESSURE CONNECTIONS

HARDY-GRIFFIN Tubing Joints are the FIRST Field Proved and Accepted New Design in a Decade





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*DuPont's Tetrafluoroethylene Resin

News . . .

(continued from preceding page)

Iran, to a deep-water terminal on Karg Island.

A 32-in. submarine line will be laid to an artificial island more than 24 mi. offshore, connecting at the other end with a tank farm at Fao, Iraq. Collins Submarine Pipelines Overseas, Ltd. will lay the line for Basrah Petroleum Company.

Peru

Latest Concession off Peru Consists of 91,000 Acres

A 91,000-acre lease off the coast of northwest Peru has been granted to Cia. Petrolera del Pacificio, S.A.

Peruvian Pacific Petroleum Corporation, which was preparing to begin a geological survey on an adjoining concession with the aid of the **Rincon,** a coreboat owned by Richfield Oil Corporation, will also serve as operator on the newest lease.

Spain

New 50-50 Spanish Oil Law Favorable To Foreign Firms

Spain will likely get more oil investments from foreign operators as a result of the new 50-50 oil law which was recently passed.

The new law grants foreign operators exploration rights on a maximum 800,000 hectares (one hectare equals 2.471 acres) per company in continental Spain and 4 million in the Spanish Sahara. Permits run for 12 years and include two extensions. The law establishes 50-year development concessions.

The statute reserved 3.5 million hectares for the state-owned company.

Texas

HOMCO Pays $7 Million For Oil Tool Rental Firm

Houston Oil Field Material Co., Inc. has purchased Associated Oil Field Rentals, the world's largest oil tool rental company. The move is the first step of a three-point expansion plan announced by Frederick W. Richmond of New York when he became chairman of the board of HOMCO last September.

Announcement of the $8 million transaction was made jointly by Hugh Q. Buck, acting president of HOMCO, and Harry J. Mosser, chairman of the board of Associated Oil and Gas Company of which the rental firm was a division.

In combining the operations of the two firms, it is estimated that savings of about $1 million annually will be realized. Associated Oil Field Rentals operates twelve rental yards in five states, and has grossed about $4.5 million annually from rentals for the past several years.

TGT Realigns Pipeline System To Create 3 New Companies

Tennessee Gas Transmission Company has realigned the administration and control of its natural gas pipeline system, establishing three new companies as major operating divisions of the parent firm.

Tennessee Gas Pipeline Company will operate the pipeline system and gas transmission business. W. C. McGee, Jr., an officer of the parent firm since 1950, was appointed president.

Tennessee Gas and Oil Company, created to operate the oil and gas exploration and production business of the parent firm and its oil and gas subsidiaries, will be headed by R. G. Graham. Graham has been an officer of Tennessee Gas Transmission since 1950.

Bay Petroleum Company is to conduct the business of Tennessee Gas

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Our 8800 pound hammer delivers 39,700 ft. pounds per blow.

Our hammers and complete conductor pipe rigging, located at New Orleans and Lake Charles can be transported anywhere in the Gulf area to your location on short notice. We deliver the equipment to your wharf site for transportation with the pipe. This hammer is ideal for work from drilling rigs.

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and its subsidiaries related to the manufacture and marketing of petroleum products at wholesale and retail levels. President is R. R. Dean who had been a Tennessee Gas officer since 1955.

Service Companies Also Set Records at Deepest Holes

While world depth records were toppling recently, major service and supply companies were setting some records in the process.

Schlumberger Well Surveying Corporation established new record depths for both logging and perforating on the Phillips Petroleum Company No. 1, E. E. University in West Texas, drilled to 25,340 ft.

Schumberger ran an electrical log, gamma ray-neutron log, microlog and dipmeter survey to a total depth of 25,182 ft.

Jones & Laughlin Supply Division furnished 4-½-in. O. D. liner that was set below 19,515 ft. at the world's second deepest hole. Shell Oil Company set 2,416 ft. of Jones & Laughlin liner with Hydril flush joints at their No. 5 Rumberger in the Elk City Field, Beckham County, Oklahoma.

Texas 11-Day Feb. Quota Will Up Production Slightly

Texas producers were granted an 11-day schedule for February by the Texas Railroad Commission. This is an increase of 31,971 bbls. over the January allowable.

Texas wells were allowed to produce 12 days during January. The 11-day pattern for February resulted in the smallest change possible because of fewer days in the month.

"THERE'S BEEN SOME MISTAKE, MADAM! THIS IS NOT THE 'QUEEN MARY'!"

State Rentals Still Required On Acreage 10½ Mi. at Sea

Texas tidelands lease holders must continue to pay rentals and royalties even though state ownership of the land is under study by the United States Supreme Court.

Companies must pay rentals and royalties to the state out to 10½ miles. However, until the court rules, they do not have to develop the lease as specified in the original contract. They must, of course, develop the undisputed acreage.

The U. S. Supreme Court has postponed decision on the Tidelands Case indefinitely.

Texas Oil Industry to Shift To Local Level During 1959

The oil industry in Texas began 1959 by shifting from a national program to a state-operated one with emphasis on meeting local problems.

The Oil Information Committee,

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News . . .

(continued from preceding page)

sponsored by the American Petroleum Institute since its inception in 1946 through 1958, has become an operating division of Texas Mid-Continent Oil & Gas Association headquartered in Dallas.

The two main activities carried on by OIC in the past will continue but will undergo gradual changes fo fit the concept of the new program.

"The combined new function incorporated into Texas Mid-Continent will take a positive approach to problems and issues facing the oil industry to strengthen its position in governmental and public affairs, because of the industry's vital importance to the state economy," said Texas OIC Chairman G. T. Pearson.

AAODC Gets Warren Baker As Executive Vice President

Warren L. Baker joined the staff of American Association of Oilwell Drilling Contractors as executive vice president February 1.

In assuming his new duties, Baker resigned his position as vice president and director of Gulf Publishing Company and also as editorial director of two of the company's oil publications.

MARKEY WINCHES

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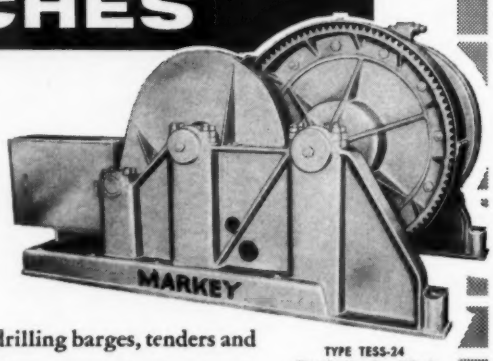

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Venezuela

Superior To Build Big Line For Maracaibo Production

Superior Oil Company will begin construction shortly on a 16 and 24-in. crude line to bring oil to shore from its wells in Lake Maracaibo.

Superior's 65,000-bbl. per day production is currently being handled by tanker. Initial capacity of the new line will be 100,000 bbls. daily with ultimate capacity of 200,000 bbls.

Designer is Pipe Line Technologists, C. A., subsidiary of Pipe Line Technologists, Inc., of Houston.

Richmond Uses Heating Coils To Move Viscous Boscan Oils

Richmond Exploration Company has installed heating coils to help move 10.4-gravity Boscan crude from open-pit storage reservoirs at its Bajo Grande refinery and terminal on Lake Maracaibo's west shore.

Steam heating loops float on rafts at the reservoir outlets. Temperature of the surrounding oil is raised to 170-180°F with steam applied from a boiler at the refinery, and a sump of hot crude forms around the intake of the pipeline to the refinery.

Crude travels 30 mi. through an 18-in. heated pipeline from the Boscan field to the refinery and deep-water loading terminal.

Richmond can store more than 5½ million bbls. of crude in the two shallow reservoirs which average some 10 ft. in depth. Dug in sandy clay, they provide cheap winter storage for the Boscan crude which is used primarily in making asphalt.

Creole's Amuay Facilities Get $7.3 Million Expansion

Terminal facilities at Creole Petroleum Corporation's Amuay refinery in Venezuela are undergoing a $7.3 million expansion program.

As part of this program, a 1107-ft. pier with a loading capacity of 40,-

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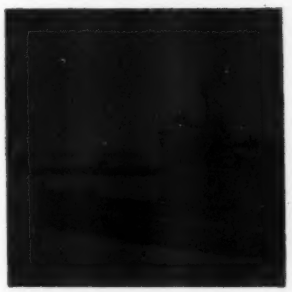
Tug MARIE G. SMITH
Length—98′
Beam—25′
Power—2200 h.p. diesel
twin screw

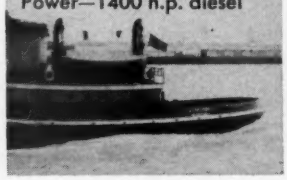
CALL CRESCENT TOWING

Tug HUMRICK
Length—142′
Beam—27′ 6″
Power—1700 h.p. diesel

Tug WM. S. SMITH
Length—144′
Beam—32′ 8″
Power—1850 h.p. steam

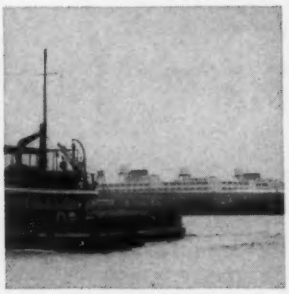


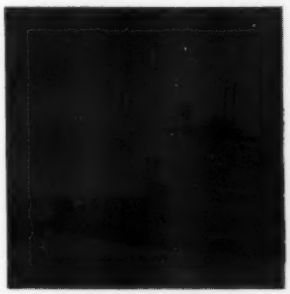
Tug OCEAN PRINCE
Length—123′
Beam—30′
Power—1400 h.p. diesel



Tug SANDRA
Length—92′
Beam—25′
Power—1200 h.p. diesel

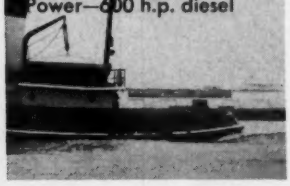
Tugs PORT ALLEN and PORT HUDSON
Length—93′
Beam—25′
Power—1000 h.p. diesel





Tug ORLEANS
Length—81′
Beam—24′
Power—750 h.p. diesel

Tug LILLIAN
Length—76′
Beam—23′
Power—600 h.p. diesel



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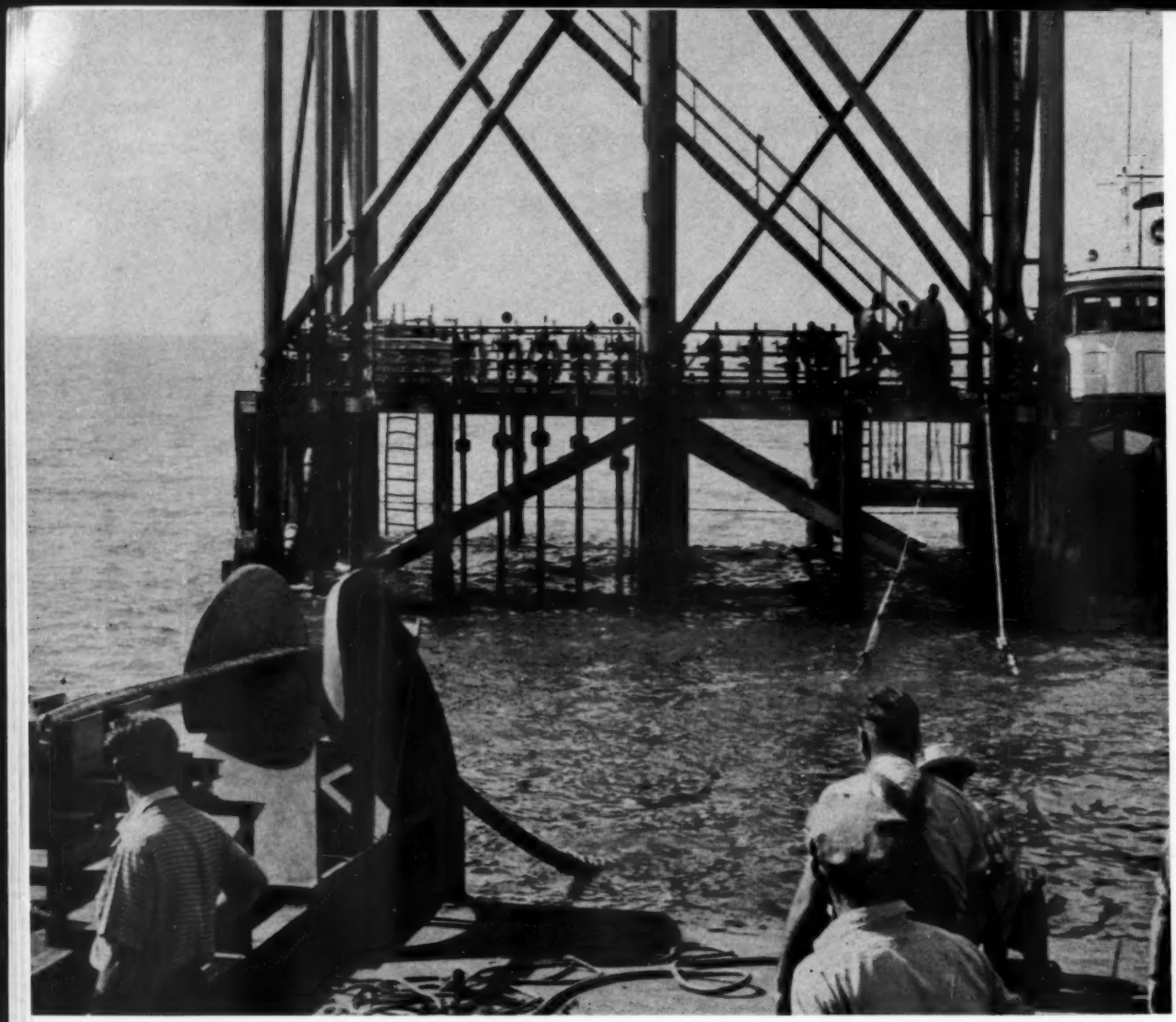


Flexible Submarine Pipe Laid In Gulf of Mexico

900 ft. of steel-wrapped line put down in 35-ft. water in 30 minutes

FLEXIBLE PLASTIC PIPE that reels off a giant spool in one piece may offer dramatic savings to marine oil operators everywhere.

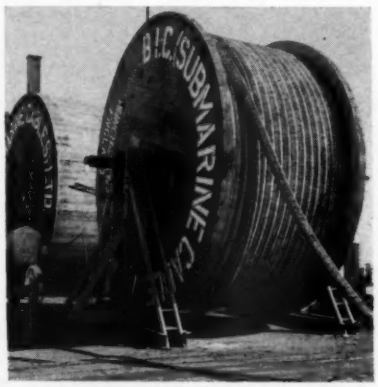
Shell Oil Company has laid 900 ft. of the new pipe in 35 ft. of water in just 30 minutes. The steel-wrapped pipe, which is now carrying crude oil from a producing well to a production platform, was spooled out (above) from a laying barge to the sea floor at a rate equivalent to the speed of the laying barge tow.

The easy-to-lay flexible pipe is being tested by Shell and the manufacturer, British Insulated Calendars, Ltd., of Manchester, England. Site of the test is Well No. 33 in Shell's South Pass Block 27 field, off Plaquemines Parish in the Gulf of Mexico. The 900-ft. flow line connects the well with Shell's "M" platform.

Plastic core . . . The pipe has a plastic core 3-in. in diameter, which is wrapped in various steel tapes and insulating materials to an outside diameter of 4½-in. The tapes provide strength to the plastic but preserve its flexibility.

Weight . . . The pipe weighs 12.2 lbs. per ft. and is designed for working pressures up to 2000 psi.

Advantages . . . While cost of the new pipe is being kept under wraps, most observers agree that it may have special value in deep-water operations because it requires no heavy equipment necessary in the handling of rigid steel pipe.



ENORMOUS FEEL 14 ft. in diameter contains 2200 ft. of the flexible pipe which has a plastic core 3 in. in diameter.

Mud Service by

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HOUSTON, TEXAS

A DIVISION OF MISSISSIPPI RIVER FUEL CORPORATION

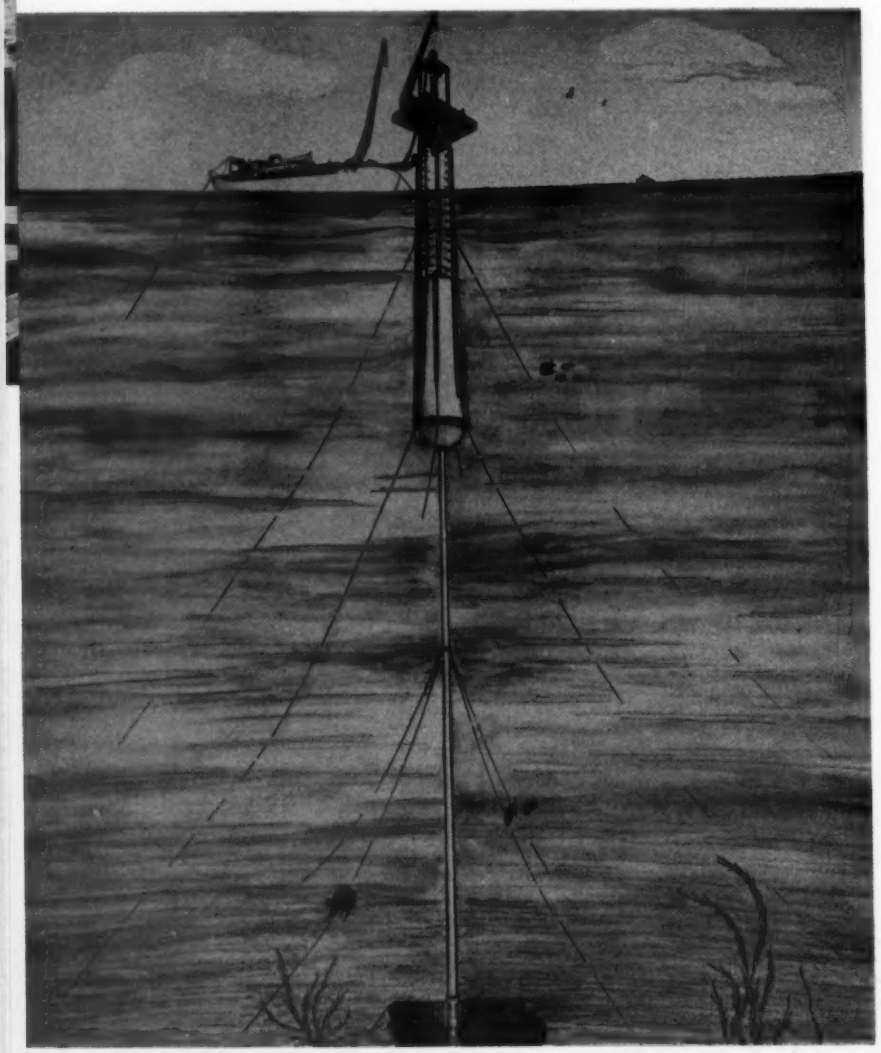
Proposed buoyant structure for drilling in 600 feet of water would require only one-third the amount of steel necessary for a fixed platform in 45 feet of water, greater depths would not radically increase costs. A revolutionary way of . . .

Meeting The Deepwater Challenge

By W. G. Wilson, Engineer
Arkansas Fuel Oil Corporation

A growing segment of the oil industry believes that deep-water offshore operations are entirely feasible. This article describes a new concept for such operations.

Industry, in general, and OFFSHORE readers, in particular, are acutely aware of the high costs of presently conventional offshore methods as compared with onshore operations.



ARTIST'S CONCEPTION of the radical new offshore drilling structure proposed by Arkansas Fuel Oil Corporation's engineers.

It is also well known that fixed and mobile platform costs increase alarmingly with water depth. There appears to be some economic, if not engineering, limit to the water depth in which these conventional offshore facilities are feasible.

When confronted with difficult or seemingly impossible problems, it is appropriate to analyze and study the peculiar condition as a potential asset or avenue of approach rather than merely as a liability or hazard to be overcome.

This philosophy has produced, for example, the marsh buggy and the snowmobile. It is also exemplified in marine transportation wherein the characteristics of water are advantageously utilized rather than considered merely a barrier to conventional land transportation methods.

Even in the relatively new offshore operations, there are evidences of this approach. The floating ship method for core drilling, which has been abundantly described in the trade journals, is one such approach. This method has proven eminently successful for core drilling and is equally applicable for exploratory and development drilling. It has the tremendous economic advantage that increasing water depth will only moderately increase costs.

When offshore geophysical operations are organized to **utilize** rather than to **overcome** the peculiar characteristics involved, the unit cost of geophysical information is considerably less than for onshore operations.

Arkansas Fuel Oil Corporation en-

gineers have proposed a new concept for offshore operations.

The method can be tailored to the specific wind, wave and other characteristics involved and provides a suitable structure for the conduct of drilling and other operations. It is considered to be particularly applicable in moderately deep and deep water.

Detailed cost estimates have not yet been prepared. However, calculations for one such structure for 600 ft. of water depth indicated a steel requirement of approximately one-third of that required for a fixed platform in 45 ft. of water. This particular computation reflected 150 mile-per-hour wind, 85 ft. waves and 250 ton load capacity at wellhead level. It is noted that increasing water depths will result in only moderate cost increases since only the conductor and cable system directly reflect water depth.

Time alone will determine whether the floating ship method, the proposed method, or some entirely different approach will be the ultimate solution of the deep water offshore problem. That specific answer, in itself, is relatively unimportant. **The important conclusion is that the problem can be solved** and probably at a cost that would be economically attractive.

In fact, since shallow waters present some problems not encountered in deeper water, it may develop that deep water operations will ultimately prove to be easier, and less costly, than those in shallow water.

An even more important corollary is that industry should not restrict its activities to the shallow waters but should geologically and geophysically evaluate, acquire holdings, and prospect attractive areas anywhere on the entire continental shelf, on the reasonable expectation that development and production facilities and know-how will be available.

How Winds and Waves Affect Deepwater Structures

An understanding of the peculier characteristics of the water and wind and wave forces involved in offshore operations is essential to the successful design of an appropriate system or structure. The water, **per se,** can be used as a means of supporting loads by buoyancy. The wind forces are essentially similar to those onshore. However, the effect is different, and greater, in that the structural facilities required to offset the leverage or turning forces involved must extend downward below the water surface to the ocean bottom.

The oscillatory waves with which we are primarily concerned are generated by the wind. The movement of the water mass, in deep water is normally in vertical circular orbits. The diameters of these are maximum at the surface and diminish with depth until the motion disappears almost entirely at a depth of approximately one-half the wave length. (Fig. I).

The wave forces tend to pulsate backward and forward, upward and downward over distances equaling the diameter of the orbit in a manner approximately similar to simple harmonic motion. Only to a minor extent does the water mass tend to migrate or travel away from that particular location.

The forces exerted by the water mass on a structure include "drag" forces, which are related to the linear velocity of the water, mass or inertia forces which are related to the linear acceleration of the water mass, and the shock or impact forces at the water surface incident to plunging or breaking waves.

It is evident that the wave forces exerted on a structure in deep water will be greater on the upper portion of that structure.

In shallow water the oscillatory motion of the water mass is distorted by the sea bottom and the characteristics of the waves are altered. (Fig. I).

At the surface, the oscillatory motion becomes elliptical in nature rather than circular and the elliptical path becomes flatter and flatter with

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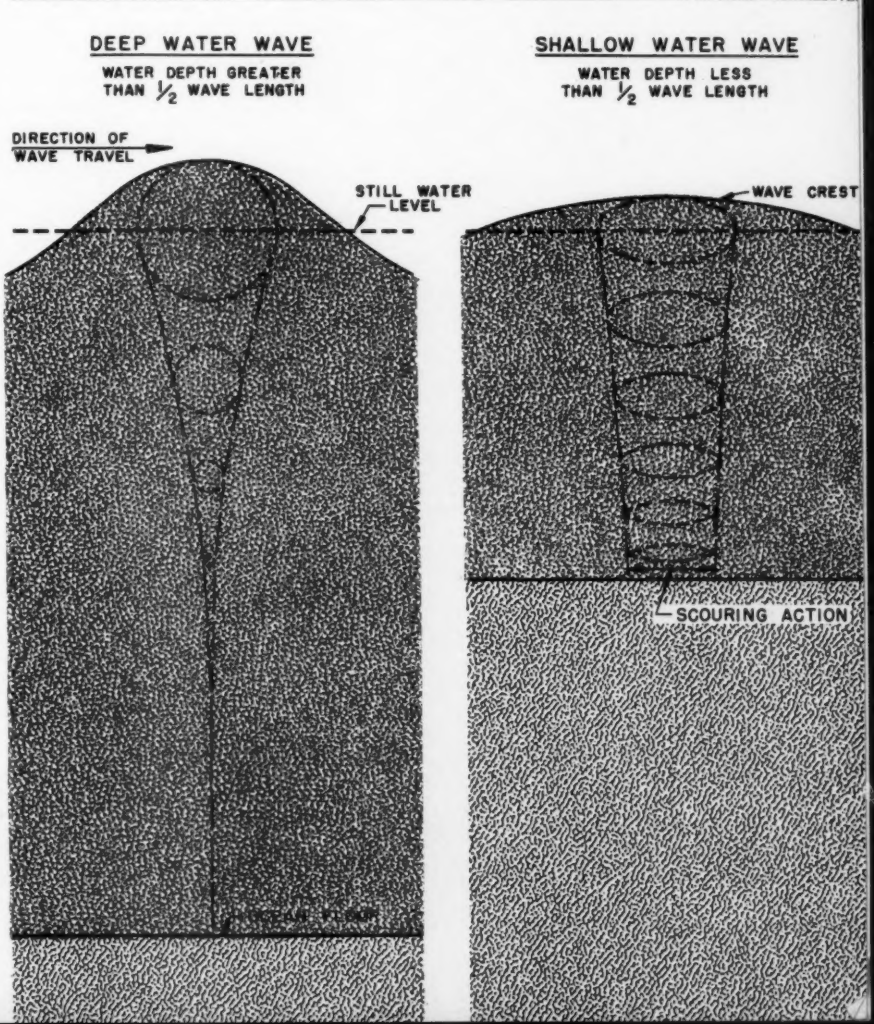
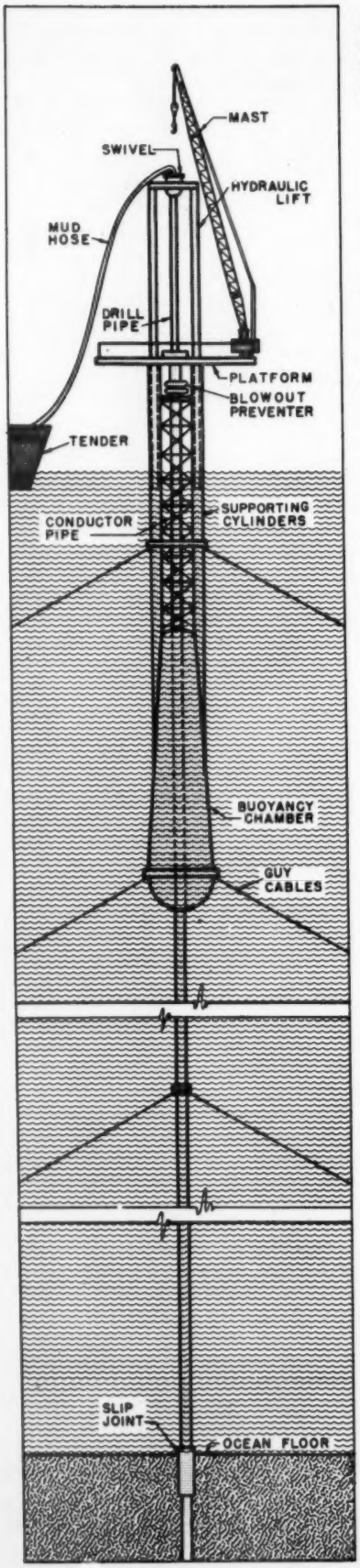


FIG. I: CHARACTERISTICS of oscillatory waves are altered as they advance into shallow water and the bottom interferes with the movement of the water mass.



increased depth until at the bottom the elliptical orbit becomes a straight line and the water mass surges back and forth along the bottom. In the shallow depths, this surging or scouring action becomes very important, especially for the mobile barge type equipment.

A New Concept in Offshore Drilling

On Page 24 is an artist's concept and Fig. II is a schematic drawing of the proposed structure. The principal components are (1) a well conductor, (2) a buoyancy vessel, (3) a supporting structure with working platforms, (4) a system of guy cables, and (5) a drilling tender or barge. Located on the tender would be as much as possible of the heavy loads such as cement, mud, fuel, water, pipe, prime movers, pumps, service company facilities, crew quarters and the like.

The conductor penetrates and is cemented to the sea bottom and extends upward to the working platforms, which are sufficiently elevated to be above even the highest storm waves.

The buoyancy chamber is annular in cross section. The conductor passes through and constitutes the interior wall of the chamber. The chamber is so positioned on the conductor that it will never be uncovered by even the greatest storm wave. The size of the chamber is dictated by the specific design requirements. It must provide buoyancy in excess of all loads on the system, to the end that the conductor below the buoyancy chamber is always under tension. There is essentially no vertical movement of the structure.

The loads that must be considered, and provided for, include (1) the dead weight of the structure, (2) the dead weight of materials and equipment on, or suspended from, the working platform, including the pipe being worked with, (3) the dynamic load incident to the particular operation,—such as handling pipe or straining to release stuck pipe, and (4) the dynamic loads generated by wind and wave forces and largely manifested by the horizontal and vertical components of the load cable tensions. (Fig. III).

The precise configuration of the buoyancy chamber reflects the proposed shell thickness and interior bracing, and the range of bursting and collapsing pressures to which the chamber will be exposed. The interior pressure is constant with the external pressure being variable due to changing wave positions.

FIG. II: SCHEMATIC of proposed offshore structure at left shows the way it would look in operation.

The supporting structure and work platforms will be as small and light as is consistent with the equipment and loads involved. They will be designed to minimize the effect of wind and wave forces. It is particularly important that the platforms be sufficiently elevated to avoid the shock or impact incident to plunging or breaking waves.

Principal items to be located on the platforms or at platform level would be the rotary table with electric or hydraulic drive (if a rotary system is used), blowout preventers and other wellhead items, power operated pipe tongs, a small capacity demountable mast or gin pole, a hydraulic lift, and the driller's control panel.

The precise facilities provided for hoisting operations would, of course, depend on the specific loads anticipated. They could consist of conventional mast or derrick equipped with lines and traveling and crown blocks.

However, heavy loads are suspended from the top of the derrick, and, under certain circumstances, this arrangement could generate an excessive turning moment on the entire structure. For this reason, particularly where heavy loads are anticipated, a hydraulic hoist is provided to do the heavy lifting.

The system is designed whereby the tubular corner members of the structure also serve as pistons for the hydraulic lift. An appropriate crosshead is provided, on which would be located either elevators or the drilling swivel dependent on the operation then being conducted.

The lift would be so designed as to enable a travel of at least the length of the longest single item to be handled and capacity to handle the largest anticipated load.

The use of a hydraulic lift for heavy loads has the advantage that the load is suspended from only slightly above the wellhead level, or possibly 80-100 feet lower than if a drilling mast were used.

Another advantage is that the hydraulic pressure can be adjusted to maintain the desired pressure on the drilling bit and the lift will automatically lower the pipe as the hole is made. With this arrangement the light mast or gin pole would stabil-

ize the pipe as it extends above the cross head and handle the joints by doubles or triples after they are broken out. Normally, slips at the wellhead would be used in conjunction with the elevators mounted on the lift.

During moderate seas when drilling operations are being conducted, the loads are essentially concentrated at or slightly above the work platform.

In the event of severe storm, the wave and wind forces are much greater and the load on the guy cables is increased. Hence the stability safety margin of the structure is reduced.

To relieve the upper structure from these storm loads to the greatest possible extent, the weight of any pipe left in the hole would be lodged on a down-the-hole-shoulder, (Fig. IV), which has been provided in the casing string at about the level of the sea bottom. The shoulder is capable of supporting great loads since the casing below this point has been firmly cemented to the next larger casing string and to the formation.

In addition, the demountable mast and much of the equipment on the working platform would be transferred to the drilling tender which would be removed to a sheltered area. Navigation aids would, of course, be installed on the structure.

Under these storm conditions, the loads on the upper part of the structure and on the guy cables would be greatly reduced and the system, if properly designed, would be able to weather any foreseeable hurricane.

The guy cable system is provided to restrain the pulsation of the chamber and the upper structure within acceptable limits and to offset the turning forces generated by the wind, wave and other dynamic loads, thus maintaining the structure in a vertical attitude. The cables also resist the torque generated by rotary drilling, if that method is used.

It is noted that with the conductor system under tension, the unguyed system is basically stable and except for the dynamic loads would require no guying. The forces on the structure and the guy cables are graphically illustrated in Fig. III.

It is envisioned that the installation of the structure would be relatively simple. It can be floated horizontally as a stripped down unit to the drilling site. Then, by controlling the buoyancy in the buoyancy chamber by partial flooding and by utilizing the boom on the drilling tender and tugs, the lower end of the conductor can be lowered until the structure assumes a vertical attitude. Further flooding of the chamber will allow the structure to settle until the lower end of the conductor penetrates the sea bottom to the desired depth.

If the bottom is relatively firm, it is possible to provide a slip joint and drive shoe at the lower end of the conductor (Fig. V) and to use the structure as a pile driver activated from the boom of the drilling tender.

If the bottom is extremely soft, it may be necessary to utilize a mud sill properly located on the conductor to limit the penetration. Or, spiral "threads" could be fabricated on the lower, exterior surface of the conductor pipe, thus enabling the installation of the conductor as if it were an earth augur. In any event it is essential that the penetration achieved be that necessary to position the buoyancy chamber at the desired level.

Making hole antd setting pipe could be accomplished by using essentially conventional equipment and methods. However, in view of the desirability of holding the loads on the structure to a minimum, it would be advantageous to modify or redesign many items and practices in order to achieve maximum compatability with the system.

From the foregoing discussion, it is apparent that the proposed system is not a mass production concept. Each structure or system must be specifically designed for established requirements and reflect water depth, anticipated maximum wind and wave conditions, the proposed well depth, the casing program, and other wactors.

Versatility Of the Concept

The basic system is flexible and enables considerable variation to meet specific conditions or preferences of individual operators. Some of the possible variations have been discussed above. Other typical variations and specific design problems include:

(1) **For relatively shallow water,** the buoyancy chamber could be omitted and the supporting structure extended to and supported by the sea bottom.

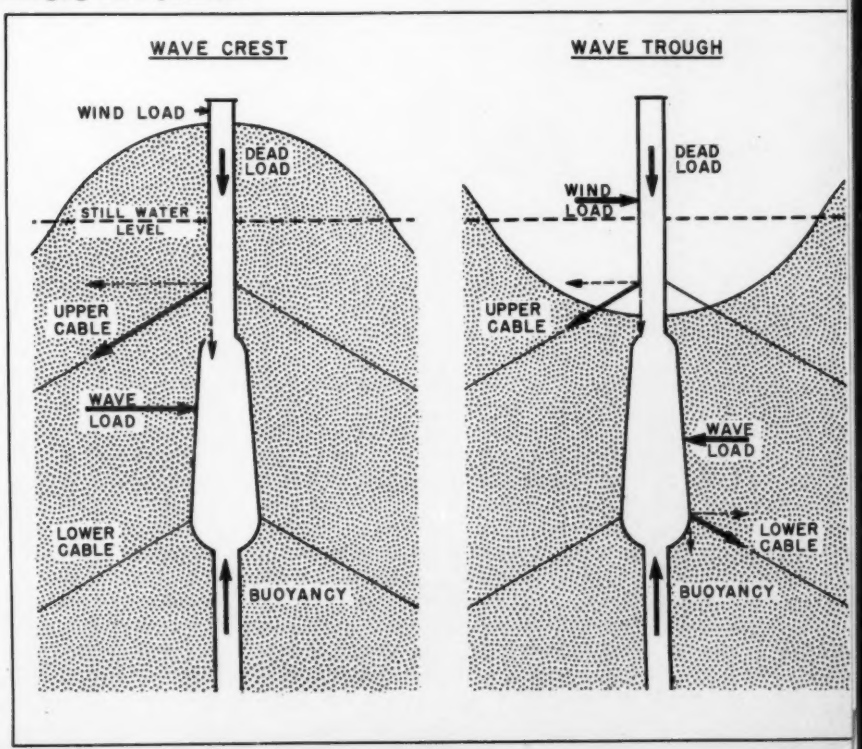
(2) **Cable anchorage** could be driv-

(continued on next page)

About the Author . . .

W. G. Wilson is a veteran member of the engineering staff of Arkansas Fuel Oil Corporation where he has devoted a great deal of his time to special engineering problems such at the one he writes about here. Collabarating with him in the study was Charles J. O'Rear, chief of the design section of Arkansas Fuel Oil's Civil Engineering Department.

FIG. III: LOADS on the anchor cables are continually changing due to changing wave positions.



en piles, augur set piles, specially designed anchors, or even massive concrete weights. In any event, they should be so designed as to permit replacing the cables if necessary.

(3) **Buoyancy** must be carefully controlled in order to provide adequate support for the loads and yet not excessively stress the cable system or the conductor. Considerable control is provided by the system of drain and fill lines, previously mentioned, to enable selective flooding of the buoyancy chamber. Another option would be the design of the chamber for anticipated maximum loads during the subsequent production stage and the utilization of auxiliary, removable buoyancy elements during the drilling stage, when much greater loads are involved. Compressed air could be used in the buoyancy chamber. However, use of a selected butane-propane mixture, which could be charged to the system as a liquid and which would generate the design interior pressure, has certain advantages.

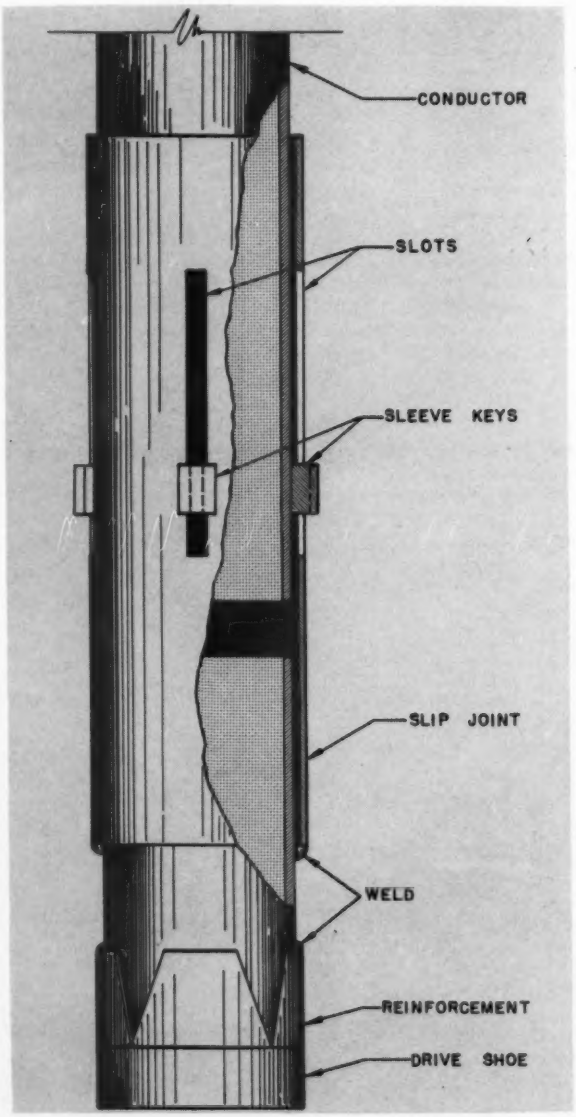
(4) **Corrosion control** would require careful consideration.

(5) **The lift,** when provided, could be designed for either hydraulic or pneumatic operation.

(6) **There is a large field for the selection and/or modification or redesign of the drilling components of the system.** An essentially conventional rotary table with electric or hydraulic drive could be used. However, the power swivel, the turbo drill or other new developments might prove to be preferable, especially from the standpoint of reducing the load on the structure.

(7) **The design** may provide for extending all casing strings to the wellhead, or it may, as shown on Fig. IV, provide a left hand threaded connection above the shoulder to enable removal of the section above the shoulder by stripping it off **after** the next smaller string has been set and cemented. There are pros and cons for each procedure.

(8) **Vibration** can be a serious problem where the frequency of the waves or the impluses generated by the equipment are in critical relationship to the natural frequency of the system or component parts thereof. The use of vibration dampening cables on the lower section of the conductor may be desirable. It is considered that careful design to avoid undesirable structural configuration —load combinations, particularly with respect to the upper structure



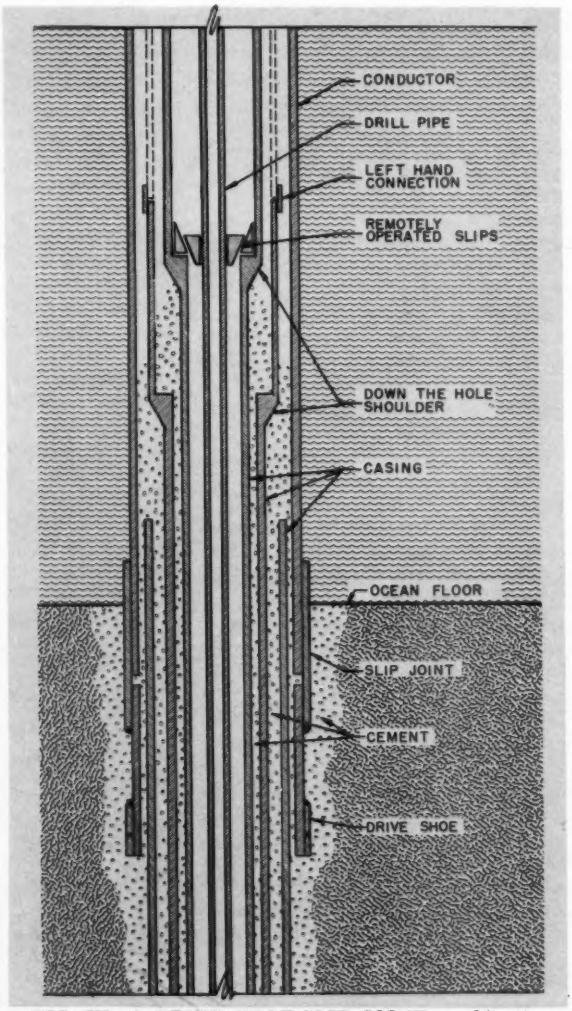


FIG. IV: A DRIVE SHOE-SLIP JOINT combination may be provided at the lower end of the well conductor to facilitate installation of the structure. (Left)

FIG. V: DOWN-THE-HOLE shoulder may be provided to support pipe loads during storms. (Above)

and the load bearing cables, will minimize this problem.

(9) **Flexing,** under stress, and stress reversals can be conducive of fatigue failures and the design must allow adequate safety factors and provide for replacement, if necessary, of certain critical components, as for example, the cables.

(10) **There are several possible methods of lodging the pipe weight "down-the-hole," when desired.** They include the use of removable, remotely operated down-the-hole slips or of conventional or specially design items that can be attached to or inserted in the pipe string to engage the down-the-hole-shoulder or even the interior of the casing.

(11) The structure and system can be designed as a **multiple well facility,** as is done on conventional platforms.

(12) **A simplified, small capacity structure** can be designed for use in core drilling operations, where the loads involved are substantially less than those of full scale exploratory or development drilling.

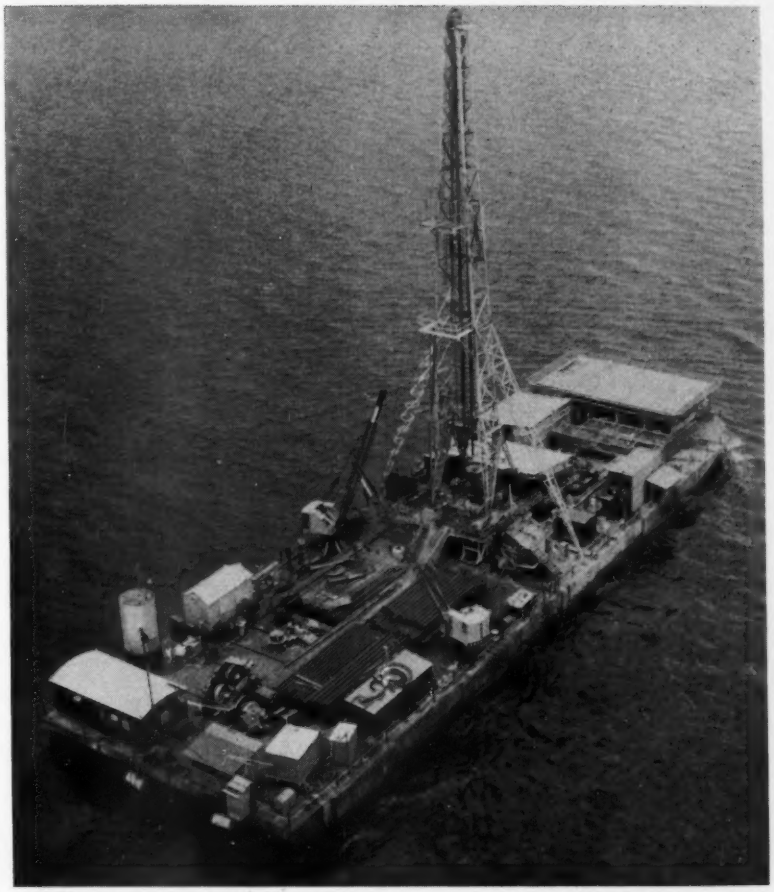
(13) **For core drilling,** or in the event of a dry hole, the conductor can be severed just above the cemented section and the rest of the unit, including the cables, can be salvaged and refitted for use at another location.

(14) As with conventional platforms, the **use of a storm choke** would provide an added safety factor against failure of the complete structure.

It is evident that conventional offshore methods, the floating ship method and the proposed system each have advantages and disadvantages.

Conventional methods are eminently satisfactory, except as to cost, in relatively shallow water. The unit cost per well may be reduced by the use of multiple well platforms, although this feature has offsetting disadvantages in the event of blowout and/or fire. Mobile platforms must consider, among other things, the movement, and scouring action, of the water at the bottom of the sea. It is considered that the depth limitations of conventional methods are primarily economic rather than engineering in nature.

Both the proposed method and the floating ship method have the advantage that increasing water depth results in only moderate cost increases, since only a few items (conductor pipe, cable system, etc.) directly reflect water depth. They are both suitable for use in deep water. Both methods can also be used in shallow water. There is probably, for each method, a break-even depth beyond which they would be economically more attractive than conventional offshore methods.



FLOATING VESSEL in the Gulf of Paria off Trinidad drilled to 10,800 ft. for costs comparable to those onshore, according to the operator, Dominion Oil Ltd. Most of the same advantages apply to the buoyancy system which seems more adapted to rough water, thereby reducing inoperative time.

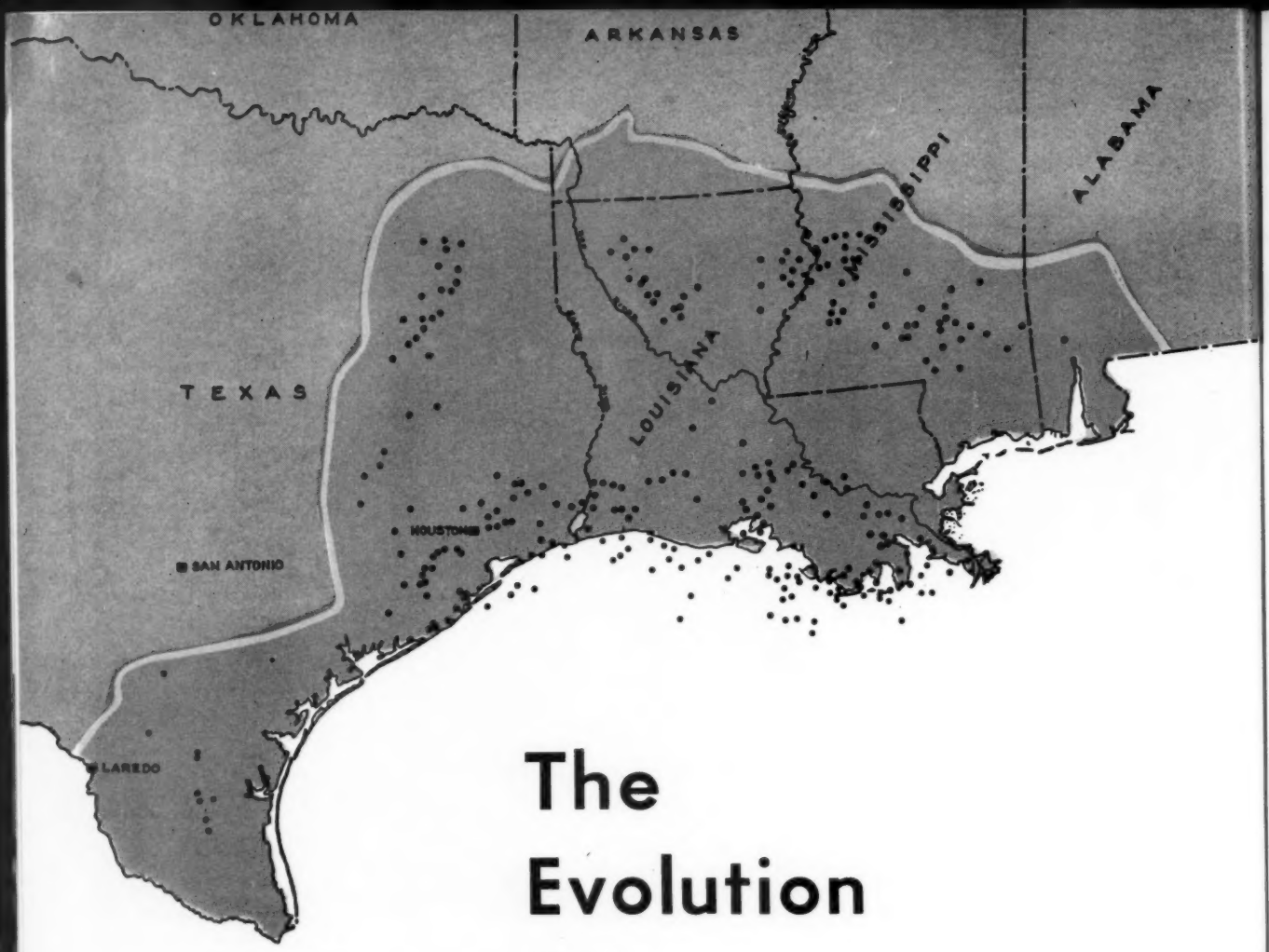
Comparison of the proposed method with the floating ship method must necessarily be made on the basis of study rather than of actual experience.

It is believed that drilling operations could be continued in rougher seas with the proposed method than with the floating ship method,—thus reducing the inoperative time. Under the proposed method, the wellhead is elevated and readily accessible for production and service operations during the life of the well. A stable platform enables more sensitive control of the bit pressures, especially if hydraulically controlled, than a pulsating ship.

With the floating ship method the matter of installing and operating a submerged wellhead by remote control and, particularly, production and well service operations during subsequent years appears to be a problem of considerable magnitude. However, the submerged wellhead would tend to reduce the requirements for navigational aids and the hazard of damage by shipping.

The problems of accessory operations, such as separation, processing, measurement, storage and disposition of the products should be quite similar in both instances, although the presence of an elevated platform, on the proposed system, capable of accommodating critical operating controls and possibly some equipment, would seem to be a considerable advantage.

It is recognized that pipelines and other facilities for deep water operations would have to be developed. However, preliminary studies indicate that this can be done.



The Evolution Of Salt Domes

What are they? How are they formed? A look at the saline monoliths that tower beneath our feet, trapping oil and gas for the drill bit

Today along the Gulf of Mexico's crescent coast, oil and gas are drawn from reservoirs abutting 278 known salt domes or structures, on and offshore.

Quite simply, the Gulf Coast has much of its oil because it has salt domes. Why? How did the salt domes form? How do they trap oil and gas? Do they still grow? Are domes in themselves valuable?

These and scores of other questions about the hidden domes have challenged geological minds since Spindletop. In Gulf Oil Corporation's Houston Production Division, Dr. M. A. Hanna, division stratigrapher and an authority on salt dome geology, has for many years compiled and published masses of geological evidence in formulating theories of salt dome origin, character and behavior. Rarely is it possible to tap such a concentrated source of knowledge as his writings on a subject so specialized and labyrinthian, yet of primary interest to oilmen everywhere. Let's look at some of the data Dr. Hanna has prepared.

Production history . . . To realize the importance of petroleum reserves associated with salt domes, consider just those domes along the Texas coast which, by the end of 1956, had *each* produced over 50 million bbls. of oil *(see chart)*. Of these 17 domes, 12 have produced over 90 million bbls., and their total production at the start of 1957 stood at 2,200 million bbls. Five of these domes force their tops within less than 1,000 feet of the surface. There are seven whose caps

Condensed from an article appearing in the OILMANAC. Illustrations courtesy of Gulf Oil Corporation.

At left, domes of the Gulf Coast area. The landward limit of the subterranean bed of mother salt from which they rose is shown in red.

have yet to be touched by the drill bit.

Other coastal domes . . . There are 278 principal domes ranging from the southern tip of Texas to just across the Alabama border, and many more have been detected through geophysical surveying.

What is a salt dome? . . . Visualize a mass shaped like the buttes and mesas across the Southwest, only many, many times larger and the blue-gray color of an ice cube. It's all underground. It may be almost 8 miles high and 1 to 8 miles in diameter.

Of course, domes vary not only in size but in shape as well. Small domes may contain a modest 10 cubic miles of 90 to 95 percent pure salt.. The big ones boast as much as 75 cubic miles or more. As to the 5 to 10 percent of impurities, most of this is anhydrite. These impurities are often left near the top of the dome as water dissolves the salt. Deposited out first atop the salt is an anhydrite sand that becomes hardened to rock and is termed massive anhydrite. At lesser depths this material takes up water and becomes gypsum. Above this forms limestone caprock which, on some domes, contains large deposits of sulphur.

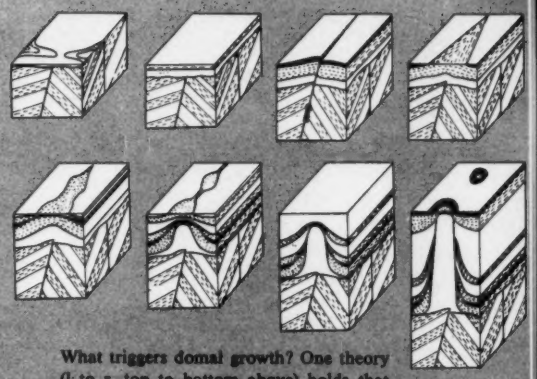
Origin . . . Salt domes form as a result of the ever-growing weight of sedimentary deposits on deep-seated, ancient salt-bed deposits. From among the many theories, Gulf Coast area geologists generally agree that:

1) A mother salt bed is the source of Gulf Coast domes.

2) Some trigger action started the salt flowing.

3) After the triggering the salt flows due to difference in static load of sediments around and over the dome.

4) As the rising dome pushes up through the overlaying beds it usually becomes somewhat rounded in cross-section.



What triggers domal growth? One theory (l to r, top to bottom above) holds that faulting and folding of strata *underlying* mother salt causes salt domes to start rising, due to static load differential set up in sediments deposited on top of salt.

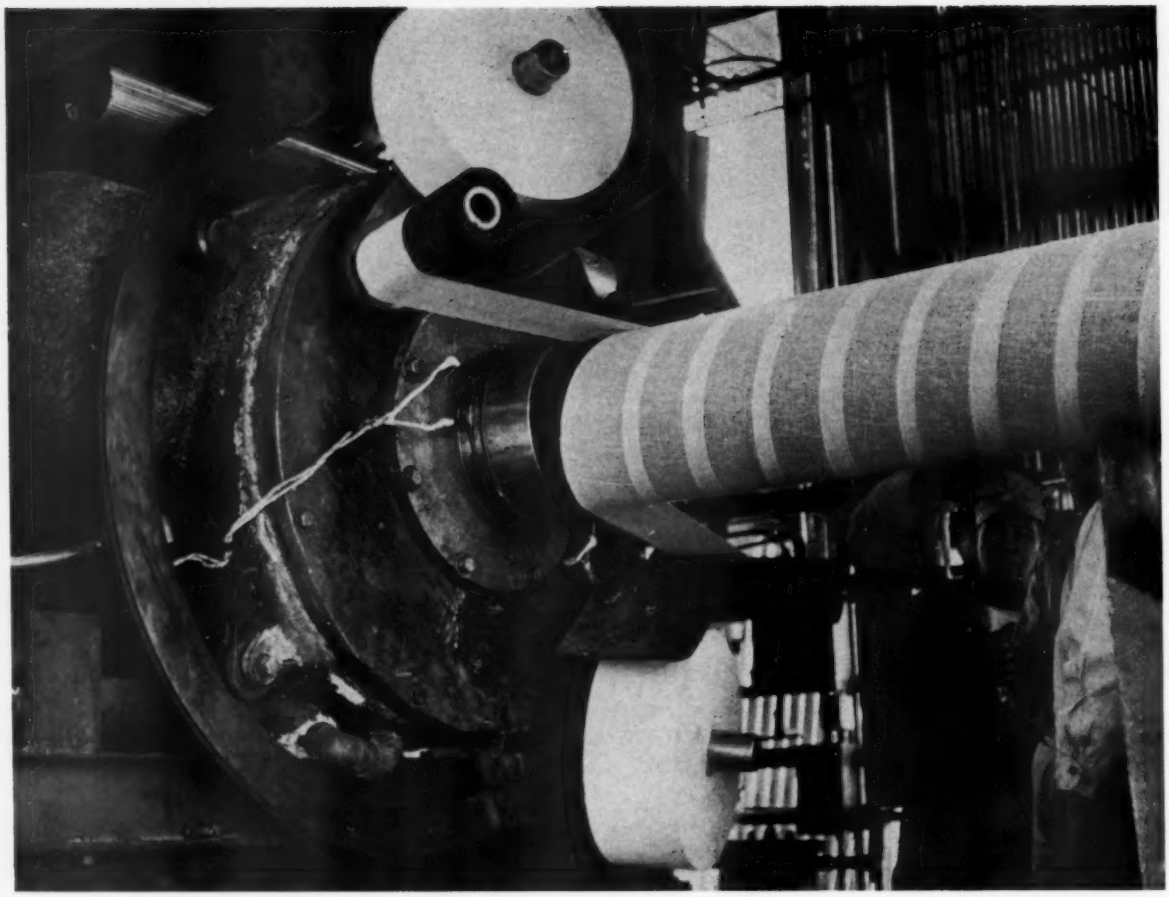
5) Flowage goes on simultaneously as new sedimentary beds are being laid down.

Growth . . . Some domes on the continental shelf are growing at the rate of a foot every 100 years. Educated estimates hold that salt flows upward through some of the conduits at a rate of a cubic mile in 50 to 75 thousand years. The mother salt for the domes beneath Texas, Louisiana, Mississippi, Alabama, northwestern Florida and the adjacent Gulf is called the Louann Salt, and is thought to be a more or less continuous bed, deposited in a great salt basin 150 to 200 million years ago. The great weight of later-deposited sediments squeezed up the domes from this salt bed. Other extensive salt horizons are known in this area and may have contributed to the domes.

This is the first part of a 2-part article. Part 2 will deal with the distribution of salt domes, and explain how and why oil and gas are trapped by the giant underground monoliths.

COASTAL TEXAS DOMES WITH CUMULATIVE PRODUCTION OVER 50,000,000

	MILLIONS OF BARRELS	75	150	225	300
Anahuac, Chambers Co.	137,611,441	DEEP, SALT NOT REACHED			
Barbers Hill, Liberty Co.	104,676,856	TOP OF SALT, 1000 FEET			
Conroe, Montgomery Co.	361,489,479	DEEP, SALT NOT REACHED			
Goose Creek, Harris Co.	96,306,716	DEEP, SALT NOT REACHED			
Hastings, Brazoria Co.	277,001,196	DEEP, SALT NOT REACHED			
Hull, Liberty Co.	128,316,502	TOP OF SALT, 595 FEET			
Humble, Harris Co.	139,191,035	TOP OF SALT, 1200 FEET			
Manville, Brazoria Co.	56,285,808	DEEP, SALT NOT REACHED			
Pierce Junction, Harris Co.	74,457,138	TOP OF SALT, 950 FEET			
Raccoon Bend, Austin Co.	59,192,985	TOP OF SALT, 11,365 FEET			
Sour Lake, Hardin Co.	97,653,376	TOP OF SALT, 719 FEET			
Spindletop, Jefferson Co.	134,203,408	TOP OF SALT, 1200 FEET			
Sugarland, Ft. Bend Co.	52,819,178	TOP OF SALT, 4280 FEET			
Thompson, Ft. Bend Co.	169,783,154	TOP OF SALT, 9314 FEET			
Tomball, Harris Co.	57,451,595	DEEP, SALT NOT REACHED			
Webster, Harris Co.	222,597,172	DEEP, SALT NOT REACHED			
West Columbia, Brazoria Co.	123,119,800	TOP OF SALT, 750 FEET			
TOTAL	2,292,156,839				

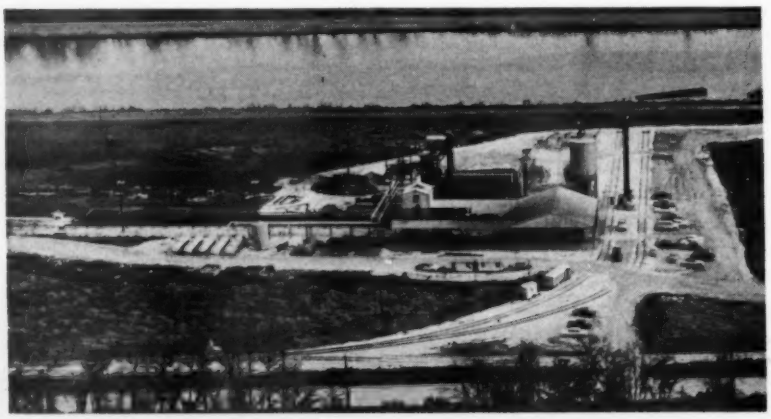


COATED PIPE emerges from the extrusion head and is cloth coated before it is conveyed through the water shower.

In operation at Harvey, La.

World's Largest Pipe Coating Plant

Three hundred joints of asphalt coated, corrosion resistant pipe every ten hours. That's maximum production for the world's largest pipe coating plant, which has begun operations at Belle Chasse, south of New Orleans.

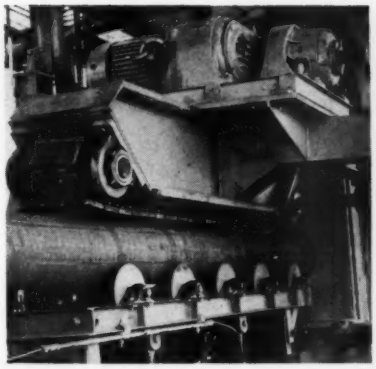


PIPE COATING YARD at Belle Chasse near New Orleans can turn out up to 300 60-ft. joints of asphalt coated pipe for the marine oil industry every ten hours.

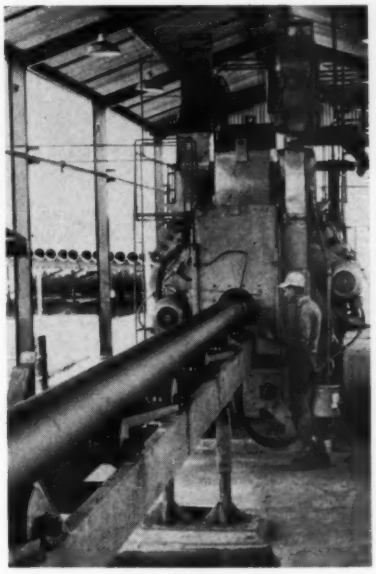
The 10-acre plant owned by the Timcoat Corporation utilizes the new Timcoat process which coats the pipe with a hot mixture of 9 percent asphalt, 30 percent sand, 45 percent barite, 15.48 percent limestone and barite fines and .52 percent glass and rubber.

Since the mixture weighs 160 pounds per cu. ft., there is no problem in obtaining specific gravity sufficient to keep the pipe on the sea bottom, and tests have shown that it is five to fifteen times more resistant to corrosion than the thickest coal tar that can be applied.

The Timcoat plant, under the supervision of Harry Knickerbocker, approaches automation in operation,



RAW PIPE pushed through the grit blast machine for cleaning, above, comes out onto the conveyor belt shiny and ready for coating, below.



since both pipe and material are handled automatically by conveyor systems.

Raw pipe goes through a heater to dry and from there through a combination shot and grit blast machine for cleaning. A collar is applied to each end to prevent coating the ends of the pipe, and it is moved through an extruder which can apply a coating from 7/8 to 2½-in. thick on all diameter pipe.

Immediately after it comes out of the extrusion head, the pipe receives a spiral wrapping of cotton fabric and from there moves along four 60-ft. conveyors under a cooling shower. Final step is to give it a lime coating.

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Against Corrosion in Offshore Equipment

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CORROSION — protects against the corrosive effects of salt water, marine atmosphere and chemicals

IMPACT and ABRASION — coating resists damage during fabrication and under rough treatment of dropped tools, pipe and other heavy objects

HAZARDOUS FOOTING — provides a non-skid walking surface.

The following Carbomastic-Phenoline combinations are recommended for areas exposed to varying degrees of corrosion:

JACKET SECTION — one coat of Carbomastic and two coats of Phenoline in the splash zone. Carbomastic for resistance to marine atmosphere, Phenoline for resistance to impact, abrasion and chemicals

DECK SECTION — for deck section of platforms: one coat of Phenoline Primer and one coat of Phenoline Finish

BARGE EXTERIORS — for hulls, rakes, bottoms, etc.: one coat of Carbomastic and two coats of Phenoline for protection against marine atmosphere, impact, abrasion and chemicals

NON-SKID COATING — for hazardous walking areas on steel decks: one coat Phenoline Primer and one coat Phenoline Finish with Special Silica Filler

BARGE INTERIORS — one or two coats of Carbomastic, for protection against condensation and sweating.

WRITE for details of Carboline's "Engineering Approach" and bulletins 600 and 803.

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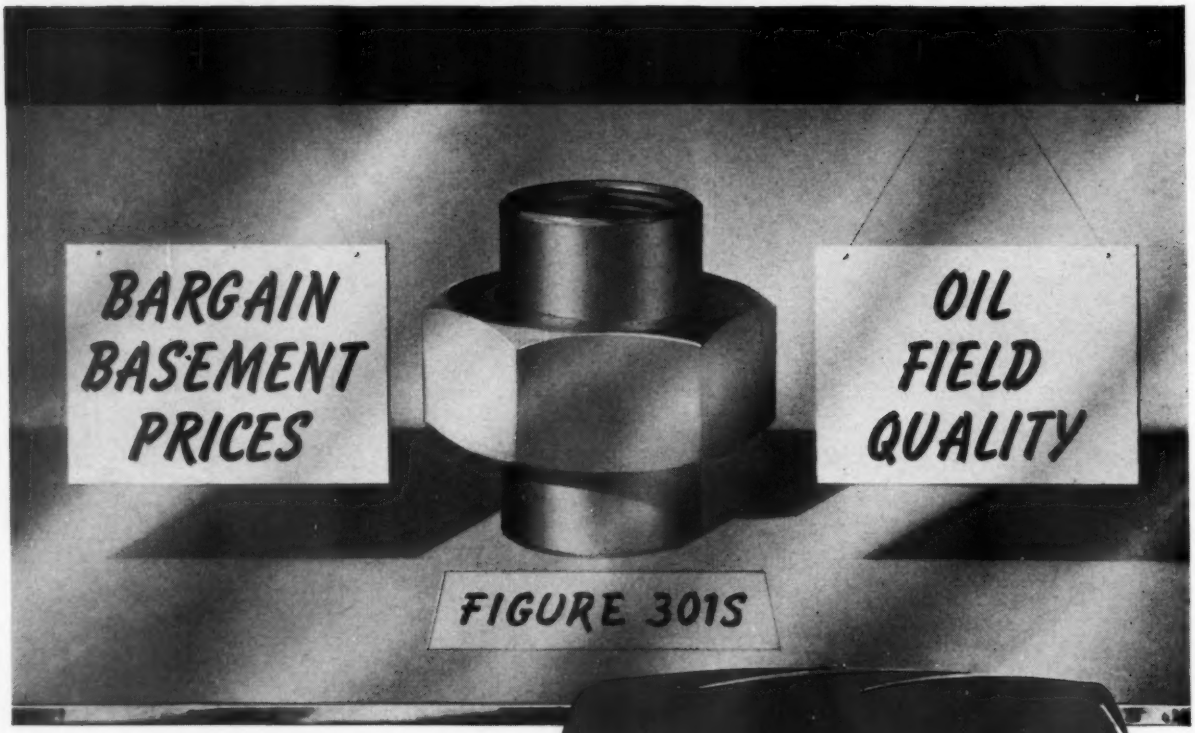

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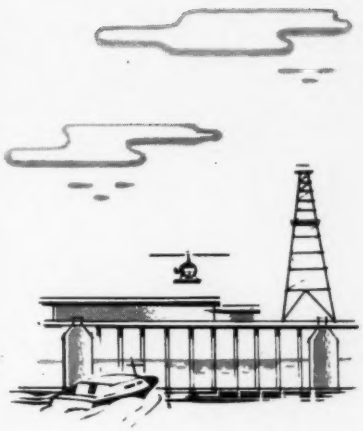
OWNER	NAME	WATER DEPTH	PRESENT STATUS
Barnwell Offshore, Inc. Self-elevating 176′ x 176′ x 152′ with three 145′ legs	"Mister Cap"	to 100′	Drilling for Sinclair-Sohio, Block 153, Ship Shoal area
Blue Water Drilling Corp. Submersible	Rig No. 1	70′	Drilling in Block 129, Ship Shoal area, for Gulf Oil Corp.
The California Company Submersible 11′ x 90′ x 156′ with four 3′ x 10′ x 35′ pontoons	S-45		Main Pass, Louisiana, Rowan Drilling Co.
The California Company Submersible 12′ x 90′ x 190′, with four 4′ x 24′ x 50′ pontoons	S-55		Bay Marchand, Louisiana, Noble Drilling Company
Coastal-Marine Drilling and Construction Corp. Submersible	Coastal Mariner No. 2		Completed well in Carancahua Bay. Now idle.
Continental Marine Exploration Co. Submersible 230′ x 99′ with 54′ between fixed hulls	"M & H Drilling Platform No. 12"	To 30′	Test location State Tract 128A
Coral Drilling Company Submersible 180′ x 151′ x 84′ with four pontoons	"Mr. Arthur"	to 70′	Bay Marchand, California Co.
Deepwater Exploration Co. Self-elevating overall 121′ x 118′	"Deepwater No. 2"		Completely salvaged unit at LeTourneau, Vicksburg yard
Delta Marine Drilling Co. Submersible	"Chris Zappa"	To 35′	Drilling for Gulf Oil Corp. State Lease "PP" 192, West Delta Area.
Dixilyn Drilling Corp. Self-elevating 194′ x 152′ overall. Three 175′ legs	"Julie Ann"	To 105′	Drilling for Shell Oil Co., Block 163, Vermilion Area
C. G. Glasscock Drilling Co. Self-elevating. Deck 258′ x 104′, pad 200′ x 180′ with four 10′ dia. columns	"Mr. Gus II"	45′	Drilling for CATC West Delta, Block 69.
Gulf Marine Drilling, Inc. Submersible	Rig No. 1	20′	Drilling La. State Lease "PP" 192, West Delta, Block 25, for Gulf Oil Corp.
Kerr-McGee Oil Ind., Inc. Submersible 13′ x 54′ x 160′ with two 13′ x 14′ x 110′ pontoons	Rig 40	To 20′	Waiting on location
Kerr-McGee Oil Ind., Inc. Submersible 13½′ x 72′ x 140′ with two 13½′ x 13½′ x 140′ pontoons	Rig 44	To 40′	Drilling for Pure Oil Co., Block 32, Eugene Island
Kerr-McGee Oil Ind., Inc. Submersible 142′ x 69′ x 13′6″, with two 10′ x 11′ x 146′ pontoons	Rig 45	To 35′	Drilling Block 32, Breton Sound for Kerr-McGee et al
Kerr-McGee Oil Ind., Inc. Submersible	Rig 46	To 70′	Drilling in Block 45, West Delta area for CATC
Kerr-McGee Oil Ind., Inc. Submersible	Rig 47	To 70′	Drilling for Standard Oil Co. of Texas. High Island area
Louisiana-Delta Offshore Corp. Submersible 180′ x 151′ x 12′	Drill Barge Louisiana	To 65′	Drilling for Shell Oil Co.

LOSS PREVENTION



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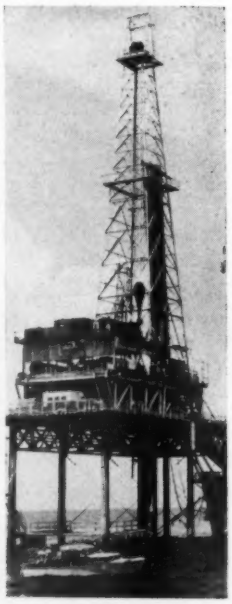

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OWNER	NAME	WATER DEPTH	PRESENT STATUS
Louisiana-Delta Offshore Corp. Submersible 156′ x 90′	Drill Barge Delta	To 25′	Drilling for Texas Co.
Magnolia Petroleum Co. (Drill barge on piling)	Rig 52		Out of service
Marine Drilling Inc. Submersible 12′ x 74′ x 200′ with four fixed pontoons	"101"	To 45′	Waiting on location, Timbalier area
Movible Offshore Co. Robert Macy Design 201′ x 211′ x 110′	"Movible No. 2"	To 80′	Drilling for John W. Mecom, West Cameron Area
Noble Barge Co. Twin-hull submersible 217′ x 100′	"Lloyd Noble S-66"	To 100′	Being built at Avondale Marine Ways
Ocean Drilling & Exploration Company Submersible 200′ x 300′ x 98′	"El Dorado"	To 70′	Drilling for CIMA, Gulf of Campeche, Mexico
Ocean Drilling & Exploration Company Submersible 132′ x 220′ x 58′	"Mr. Charlie"	40′	Drilling for California Co., Block 93, Eugene Island Area
Ocean Drilling & Exploration Company Submersible 120′ x 180′ x 49′	"John Hayward"	30′	Drilling for Self, Block 90, Eugene Island Area
Ocean Drilling & Exploration Company Submersible 200′ x 300′ x 93′	"Margaret"	To 60′	Drilling for Shell, Block 27, South Pass Area
Ocean Drilling & Exploration Company Submersible 120′ x 180′ x 50′	"St. Louis"		Stacked
The Offshore Company Self-elevating 81/2′ x 70′ x 203′ with twelve 6′ dia. caissons	Mobile Unit No. 51		Bayou Bouef, Louisiana
The Offshore Company Self-elevating 131/2′ x 117′ x 220′ with fourteen 6′ dia. caissons	Mobile Unit No. 52		Drilling for California Co., Block 167, E. Cameron area
The Offshore Company Submersible 12′ x 74′ x 200′ with four 6′ dia. caissons	Mobile Unit No. 53		Drilling for Pure Oil Co. Block 20, S. Timbalier Area
The Offshore Company Self-elevating 200′ x 104′ x 15′ with eight 12′ dia. towers	Mobile Unit No. 54		Drilling for Gulf Oil Corp., East Cameron area
The Offshore Company Self-elevating 200′ x 104′ x 15′ with eight 12′ dia. towers	Mobile Unit No. 55		Eugene Island Area
Penrod Drilling Company Submersible 196′ x 108′	Rig 50	44′	Eugene Island Area
Penrod Drilling Company Submersible 150′ x 190′	Rig 51	To 70′	Block 41, Main Pass Area
Penrod Drilling Company Submersible 198′ x 174′	Rig 52	100′	Eugene Island Area
Placid Oil Co. Twin submersible hulls, each 72′ x 178′	Petrel	To 100′	Eugene Island Area
Reading & Bates Offshore Drilling Company Self-elevating	"C. E. Thornton"	To 110′	Under tow to Persian Gulf
Rimrock Tidelands, Inc. Submersible	"Rimtide"		Stacked

OWNER	NAME	WATER DEPTH	PRESENT STATUS
Sea Drilling Corp. Submersible	"Seadrill 2"	30′	South Marsh Island
Southeastern Drilling Corp. Submersible 11′ x 90′ x 156′ with four pontoons	Rig 22, Barge 8		Drilling for Texas Co., S. W. Marsh Island prospect, State Lease 340, OCS—0310, well No. 3
Trans-Gulf Offshore Drilling, Inc. Self-elevating	"Trans-Gulf No. 10"	75′	Block 21, South Timbalier area
Union Producing Co. Submersible 160′ x 190′	Unnamed	To 76′	Under construction at Todd Shipyards Corp., Houston, Texas
Universal Drilling Company Self-elevating	"Mr. Louie"	To 130′	Under construction by Port Houston Iron Works
Zapata Off-Shore Company Self-elevating. 194′ x 152′ overall. Three 145′ legs	"Vinegar-roon"	To 80′	CATA Well #4, Block 45, West Delta, s/o 970
Zapata Off-Shore Company Self-elevating. 20′ x 80′ x 140′, with three triangular legs	"Scorpion"		On location Cay Sal Bank, Bahamas

Drilling Tenders

An-Son Offshore Drilling Co.	"Carl B. Anderson		Stacked
The California Company Converted LST, 328′ — 50′	S.21		Shipyard
The California Company Converted LST, 328′ x 50′	S-22	49′	Bay Marchand, Louisiana, Loffland Brothers
The California Company Converted LST, 328′ x 50′	S-23		Being moth balled.
The California Company LST, 328′ x 50′	S-24	37′	West Delta Area, Louisiana, Noble Drilling Co.
The California Company LST, 328′ x 50′	S-25		Bay Marchand, Louisiana Loffland Bros.
The California Company LST, 328′ x 50′	S-26		Standby. Venice, Louisiana. Loffland Bros. rig
Coastal-Marine Drilling and Construction Corp. New tender, 272′ x 56′	Howard S. Cole Jr. Coastal-Mariner No. 1		Sold to Pan American International for use in Persian Gulf
CATC Group New tender, 260′ x 54′	"J. C. Craig"	90′	Eugene Island, Block 208
CATC Group New tender, 260′ x 54′	"Carle Sharp"	101′	Ship Shoal, Block 199.
CATC Group New tender, 260′ x 54′	"Ernie Miller"	50′	West Delta, Block 45
CATC Group New tender, 260′ x 54′	"Jack Cleverley"		Drydock
Deepwater Exploration Co. Converted LST, 328′ x 50′	"Deepwater No. 1"		Block 174, Ship Shoal area
Delta Marine Drilling Co. Converted LST, 326′ x 50′	"Joseph Zeppa"		Stacked
Gulf Oil Corporation New tender	"Dolphin"		Completed placed in moth ball fleet at Orange, Tex., engines pickled, and rig stacked
Gulf Oil Corporation Converted LST, 328′ x 50′	"Eagle"		Rig stacked at Morgan City, Louisiana
Gulf Oil Corporation New tender, 272′ x 60′	"Pelican"		Block 130, S. Timbalier area, Salt Dome Prod. Co.

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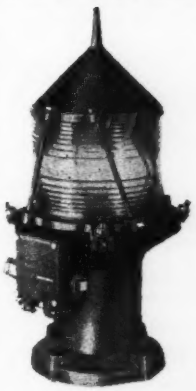

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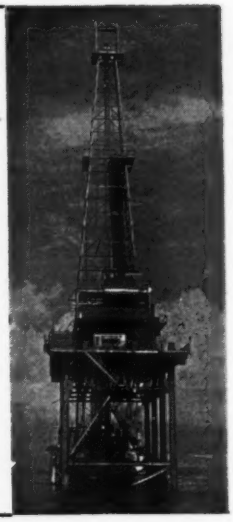

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OWNER	NAME	WATER DEPTH	PRESENT STATUS
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-1		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-2		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-3		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-4		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-5		At Orange, Texas for storage
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-6		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-7		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-8		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-9		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-10		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-11		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-12	45′-60′	South Timbalier Area, "E" platform
Kerr-McGee Oil Ind., Inc. Converted YF, 260′ x 48′	"Kermac I" Rig 16		Waiting on location
Kerr-McGee Oil Ind. Inc. New Tender, 250′ x 50′	"Kermac II" Rig 43		Waiting on location
Kerr-McGee Oil Ind. Inc. New Tender, 250′ x 50′	"Kermac III" Rig 48		Waiting on location
Kerr-McGee Oil Ind., Inc. Converted YF, 260′ x 48′	"Frank Phillips" Rig 39		Waiting on location
Llano Drilling Company New tender, 260′ x 54′	"Clayton G. Dorn"		In Drydock Orange, Texas
Magnolia Petroleum Co. Converted YF	"Gulf Coast Barge No. 2"		Out of Service
MCN Group Converted YF	MDT-1		Block 119, Eugene Island Area, Well C-6 drilling
MCN Group Converted YF	MDT-2		Out of Service
MCN Group Converted YF	MDT-3		Out of Service
MCN Group Converted YF	MDT-4		Out of Service
MCN Group Converted YF	MDT-5		Out of Service
MCN Group Converted YF	MDT-6		Out of Service
MCN Group Converted YF	MDT-7		Out of Service
Pan American Petroleum Corp. Converted LST, 328′ x 50′	"Pan American 50"		Orange, Texas
Phillips Petroleum Company Converted YF, 260′ x 48′	"K. S. Adams" Rig 40		Inactive
Reading & Bates Offshore Drilling Company	"J. W. Bates"	60′	Drydock, Preparing for tow to Persian Gulf
Reading & Bates Offshore Drilling Company	"George M. Reading	71′	Drilling in Block 120, Vermilion Area for CATC
Reading & Bates Offshore Drilling Company	"J. C. Craig"		Drilling in Block 208 Eugene Island Area for CATC

OWNER	NAME	WATER DEPTH	PRESENT STATUS
Southeastern Drilling Corp. Converted YF	Rig 12 Barge 9		Shut down, Industrial Canal, New Orleans, Louisiana.
Zapata Off-Shore Company Converted YF, 240' x 48'	"Nola No. 1"		Southern Shipbuilding Corp., Slidell, La.

Self-Contained Platforms

COMPANY	DESCRIPTION	YEAR BUILT	LOCATION	WATER DEPTH
Brewster Bartle Off-Shore Co.			Block 30, West Delta	50'
CATC Group	110' x 146'	1956	Block 45, West Delta	50'
CATC Group	110' x 146'	1957	Block 47, Grand Isle	88'
CATC Group	110' x 146'	1957	Block 45, West Delta	50'
Dixilyn Drilling Corp. Rig #7	120' x 145'	1956	Rig removed and in storage at Dupont's Bayou Bouef yard	
Gulf Marine Drilling, Inc. Rig #2			Bayou Bouef, awaiting location	
Gulf Oil Corporation	40' x 100'	1957	Rig Stacked at Morgan City, La.	
Humble Oil & Refg. Co. Rig #50	78' x 200'	1956	Stacked	50'
Humble Oil & Refg. Co. Rig #54		1958	E Platform, Block 54, South Timbalier Area	
Mecom Petroleums	82' x 193'	1948	Rig removed from platform	34'
Phillips Petroleum Co.	85' x 140'	1955	Block 184, Eugene Island Area, vacated, platform remains	84'
Phillips Petroleum Co.	88'9" x 140'	1955	Block 129-A, Eugene Island Area, platform inactive	52'
Phillips Petroleum Co.	88'9" x 140'	1956	Block 172, Eugene Island Area, vacated platform	77'
Phillips Petroleum Co.	88'9" x 140'	1956	Block 191, Eugene Island Area, platform inactive	81'
Phillips Petroleum Co.	88'9" x 140'	1957	Block 129, Eugene Island Area, platform inactive	57'
Pure Oil Company Converted LST	328' x 50'	1958	Orange, Texas	
Pure Oil Company	52' x 106 with 51' x 82' pipe rack	1957	Well completed, rig removed	72'
Shell Oil Company	55' x 110'	1958	Block 176, Eugene Island Area	86'
Sinclair Oil & Gas Co.	118' x 142'	1957	Block 175, Eugene Island area (wells shut in)	85'
Sinclair Oil & Gas Co.	118' x 142'		In storage at McDermott Bayou Bouef yard	
Sinclair Oil & Gas Co.	80' x -80'	1955	Block 15, South Timbailer Area, (well shut in)	7'
The Superior Oil Co.	96' x 225'	1958	Drilling B-3, Block 76, Vermilion Area	
Union Oil Co. of California			B-1, Block 76, Vermillion Area, Southeastern Drilling Corp., Rig 7	

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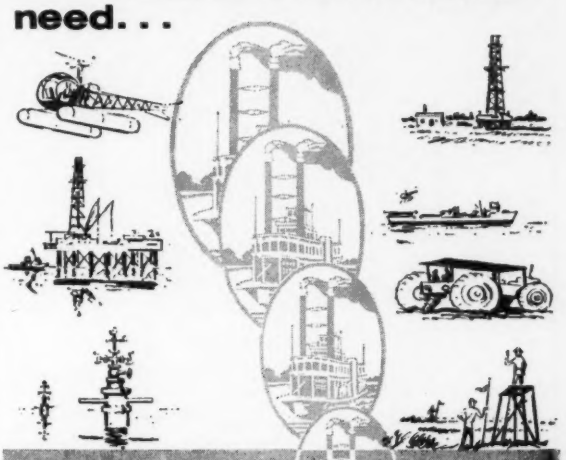

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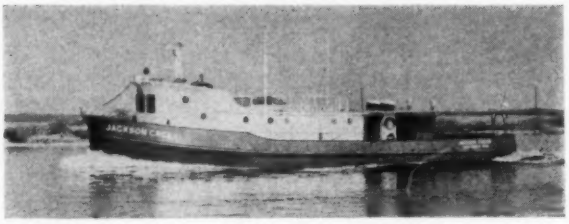

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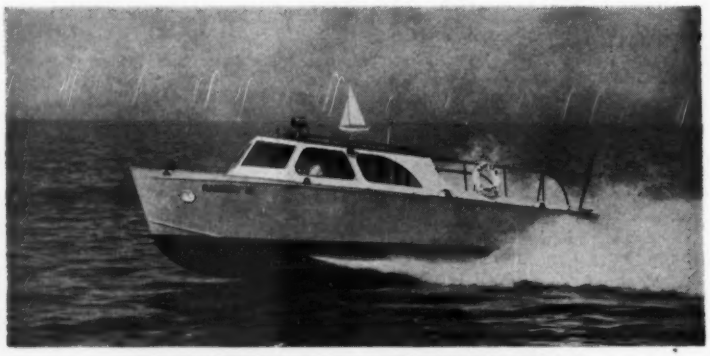

POWER BY KENNEDY

. . . aboard this 32' all-steel crew boat whose 38.3 m.p.m. makes her the FASTEST boat of her type IN THE WORLD. Twin screw, she was built by Equitable Equipment Co. of New Orleans and is powered by two GM Series 6-71B marine diesel engines supplied by . . .

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News . . .

(continued from page 20)

000 bbls. per hour was completed last March. This pier, equipped with new hydraulically-operated loading lines, can take care of two supertankers up to 60,000 DWT.

Nearing completion is the project extending Amuay's three smaller piers by 200 ft. each to a length of 870 ft.

A third phase of the modernization program already completed is the dredging of the harbor to 41 ft. to accommodate the larger tankers.

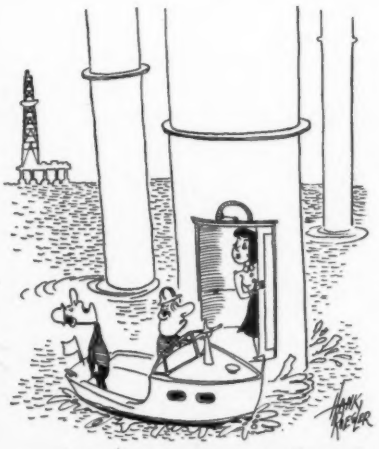
When completed, pier facilities at Amuay will be able to load approximately one million bbls. of oil daily at peak capacity.

Thick Jointed Aluminum Pipe Will Be Used in Maracaibo

Superior Oil Company is the first company to make operational use of thick jointed aluminum pipe.

The company will use 8000 ft. of the pipe in its underwater flow line system in Lake Maracaibo, Venezuela. Superior is also using aluminum-jacket offshore drilling structures and an aluminum-jacket flow station platform in the lake.

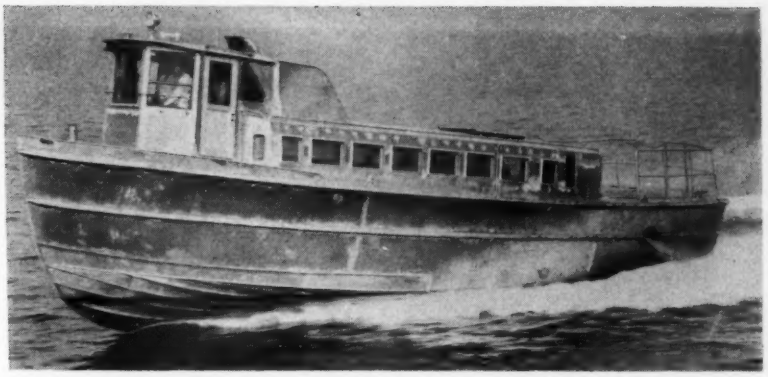
Developed by Reynolds Metals Company, the pipe is extruded to provide extra thickness at the pipe ends where joints are made, while utilizing less metal in the pipe body. Aluminum has found special application in the corrosive waters of Lake Maracaibo.



"WOW!...THIS IS A TALL RIG!"

News from the
SHIPYARDS

A Boat That Maneuvers Easily in Rough Seas



NEW VESSEL with the Polyhedral hull designed by Higgins makes up to 40 mph in rough water.

An all-welded aluminum personnel boat has been developed which is capable of high speed operations in rough water with no loss of maneuverability.

Radical new feature of the vessel and the one which gives it the increased performance in rough seas is a new hull design called Polyhedral originated by Higgins, Inc.

POLYHEDRAL DESIGN consists of a series of "breaks" cut into the outside hull to deflect water flow away from the hull.

Fabricated of aluminum alloy 5456 supplied by Aluminum Company of America, the 52-ft. craft carries up to 30 passengers. Two 500 hp solar gas turbine engines, built by Solar Aircraft Company, power the light metal craft in the 40 mph range.

In the Polyhedral design, frames are formed in the conventional curved shape, and a series of steps then were cut into the outside edge of each frame, giving a sawtoothed appearance.

These "breaks" create a greater amount of deadrise than would be possible with the conventional smooth skin bottom with the same area and depth. This offers a smaller angle of entry into the water surface which reduces the wave impact. The "breaks" deflect water flow away from the hull, and frictional resistance is thereby reduced and a cushioning effect on the downward movement of the bow results.

Approximately ten tons of aluminum sheet and plate, ranging from 3/16-in. to 1-in. in thickness, were used in the prototype vessel. Cold formed 5456 plate, extending aft from the bow, was fitted in the corresponding notches of each frame and welded by the inert gas consumable arc method.

Vessels Make Long Journey To Brazil "Piggy Back" Style

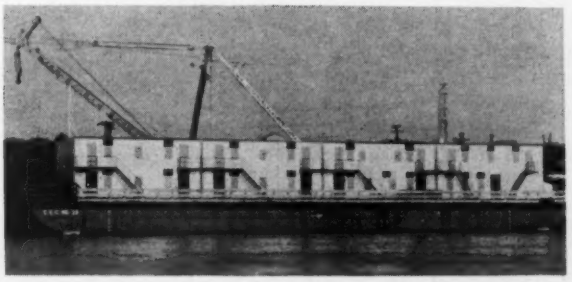
"Piggy-back" hauling was used recently to transport a fleet of vessels built by Equitable Equipment Company to Brazil.

An estimated $250,000 in transportation costs were saved for Petroleo Brasileiro, S.A., government oil company, by towing the vessels in the following manner: Two 55-ft. tugs and a 65-ft tug were placed atop a 130-ft. by 36-ft. barge. Two other barges each hauled a 55-ft. tug and a 45-ft tug.

(continued on next page)

Built by Equitable for new Persian Gulf pipe laying fleet

CREW BOAT Pat H will transport personnel during the laying of the new Persian Gulf line that will carry oil and gas from offshore wells to shore. The all steel 54 footer is powered by two twin screw General Motors 6-110 diesel marine engines. This vessel and the quarters barge left for the Persian Gulf recently with six others built by Gulf Coast shipyards.



QUARTERS BARGE, an all welded steel structure measuring 160 ft. by 45 ft. by 10 ft., will provide living quarters for Collins Construction Company personnel while they lay a submarine pipeline in the Persian Gulf off the island of Karkgo. This barge contains four 30 ft. by 35 ft. steel housing units that can be skidded on and off the barge.

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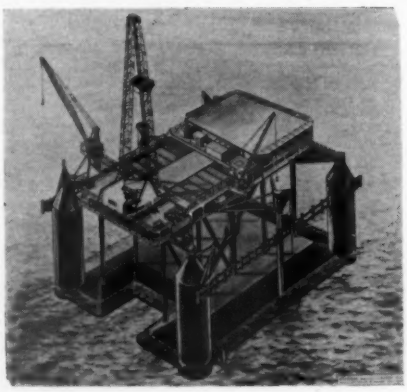
Housekeepers aboard the "Louisiana Offshore # 1"



We at Foods and Services, Inc., are proud to have been selected to handle the feeding and housekeeping for the men who work aboard the LOUISIANA OFFSHORE #1 of the Louisiana-Delta Offshore Drilling Corporation. Like these men, we are specialists in our own field—that of caterers and purchasing agents to oil companies and drilling contractors operating offshore.

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The barges were each pulled by a 65-ft. tug.

The flotilla encountered 25-ft. seas and winds up to 20 mph during the 3460-mi. tow.

First of Three Tugs Ready For Oil Firm in Persian Gulf

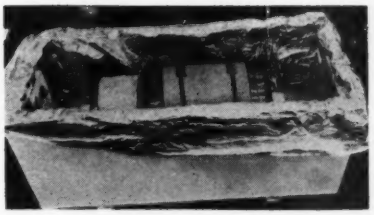
First of three new 1500 hp diesel tugs which will go to work for BP Tanker Company in the Persian Gulf has been completed by Scott & Sons, Bowling, Scotland.

The **Delevar**, which will see service at the Iranian crude oil loading port of Bandar Mashur, has a maximum operating speed of twelve knots. Overall length is 120′; breadth 31′6″ and draft about 12′7″.

Fully air conditioned quarters accommodate five officers and a crew of 25. Fire fighting and salvage equipment includes two Rolls Royce engines coupled to Merryweather fire and salvage pumps and four mechanical foam generators, each with an output of 1800 gallons of foam per minute. Underwater hull plates are cathodically protected.

Two other tugs for BP will be similar in design when completed. The second vessel, the **Zerang**, is being constructed at Scott & Sons and is scheduled to be launched late this year. The third tug will be built by Ferguson Bros., Port Glasgow, Scotland.

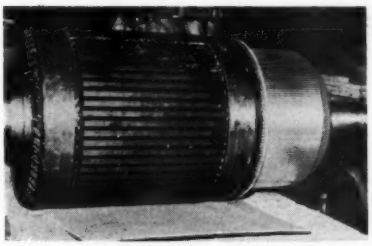
"MUST THIS HAPPEN EVERYTIME YOU RETURN FROM A WEEK OUT ON THE RIG?"



Spare armature gets . . .
Portable Warehouse

The odd looking object above with the coffin-like appearance is a 600-pound portable warehouse for a 2400-pound spare armature placed on an offshore drilling rig operating in Nigeria.

Because of the extremes in temperature and humidity in Nigeria, the armature (shown below) had to be specially packaged by General Electric Company, the manufacturer. The "portable warehouse" was de-



signed to keep it factory fresh for at least five years.

The armature and several bags of silicon-gel for moisture absorption, is wrapped in lead foil and heat sealed. The package was placed in polyethelene-lined box with sides of ¼-in. steel, and the top was hermetically sealed and bolted in position.

Although the spare armature may have to remain in readiness for many years, it is necessary since downtime would cost the operators thousands of dollars per day. In the isolated tidal swamps of the Niger Delta, it would take several weeks to obtain the equipment and effect repairs.

The barge-type electric drilling rig was built in Holland and towed to Nigeria by the operators, Shell BP and the Royal Dutch-Shell Group.

GULFPORT BUILT . . .

Tug ZEUS, 103' x 25' x 13'— 1200 HP General Motors Diesel Gear Drive tug, built for Intracoastal Towing and Transportation Corp., Houston, Texas. Delivered August 13, 1957.

Gulfport Shipbuilding Corporation builds many types of fine marine equipment for the oil industry . . . derrick barges, tugs, dredges, cargo barges, drilling platforms, seismic vessels, crew and cargo boats, and fast, rugged cruisers for the inshore oilfields . . . Whatever your problem, you are in capable hands at Gulfport.

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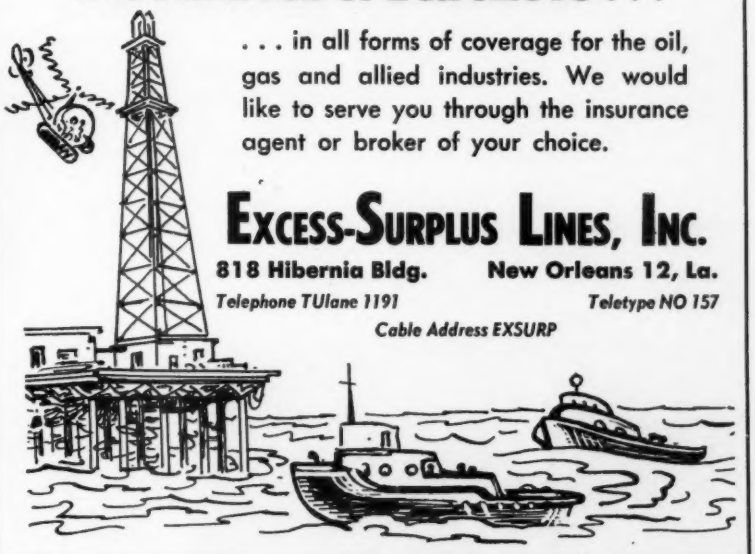

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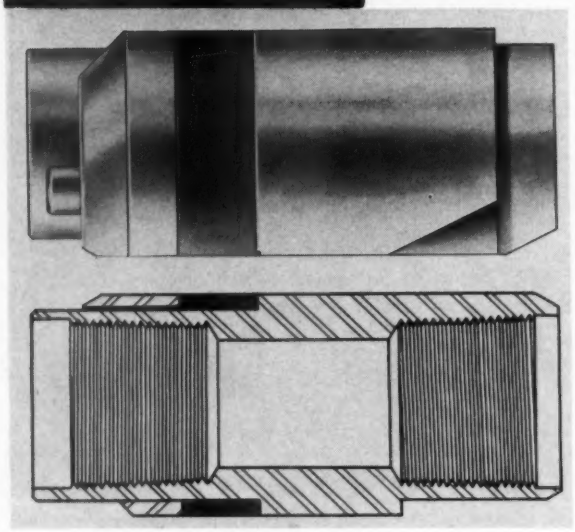
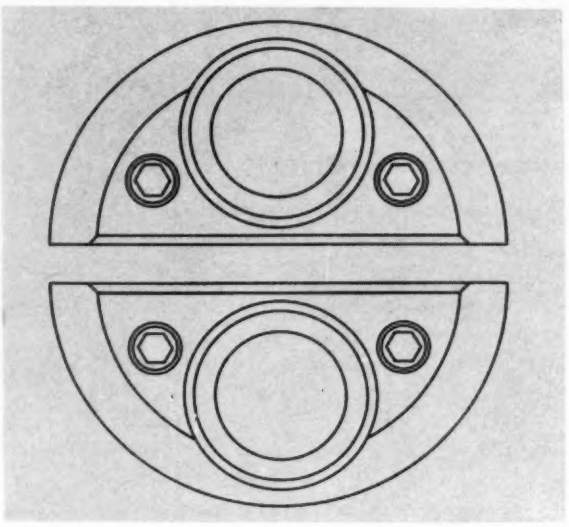




New Advance In Dual Tubing Hanger

A new dual tubing hanger provides a full area opening for tool passage and independent movement of either string of tubing.

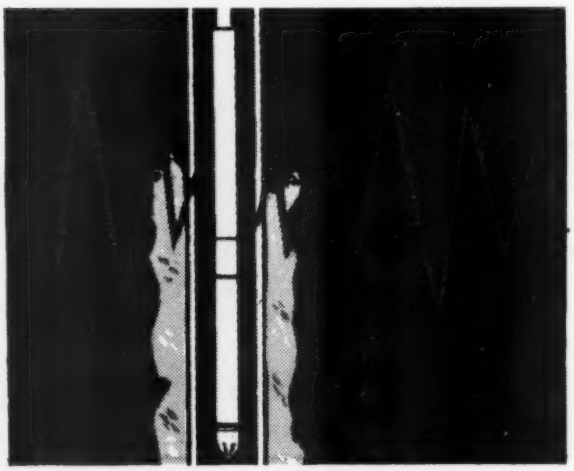
The new hanger, designed the DX-2521, is manufactured at ALCO Products, Inc.'s Beaumont, Texas, plant.

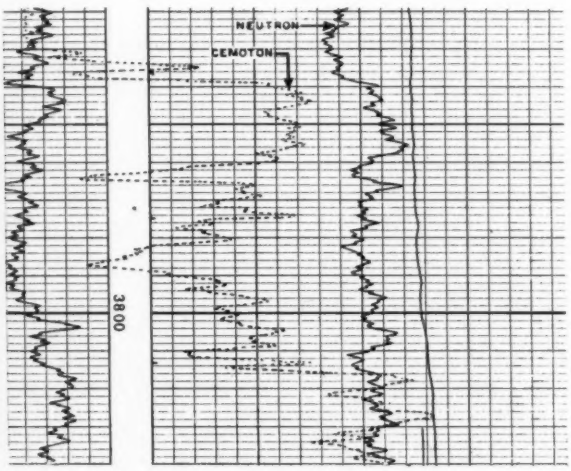
A feature of the hanger is that it permits string of tubing to be pulled or lowered independently of the other. The hanger consists of a lower segment with tubing suspension threads on the lower end and tubing handling threads on the upper end. Upper end of the hanger is provided with a recess, larger than the standard counterbore, to receive a seal nipple for isolation of the tubing string.

A neck extends above the lower section and is fitted with packing and retainer plate for compression by set screws in the tubing flanges. Two cap screws hold each assembly together.

One hanger of each pair is provided with a seat area lower than the other and with two beveled guide areas, one on either side, to properly locate the hanger in the tubing head.

For further information write Rives, Dyke and Company, 2503 Robinhood, Houston, Texas.





Positive Identification Of Cement Jobs

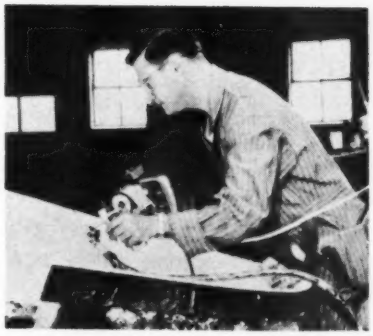
Positive identification of cement columns and tops in both new and old wells is made possible by a new Lane-Wells service called Cemeton. Cemeton shows uncemented sections more readily than a temperature log, and interpretation is more accurate because Cemeton is unaffected by thermal lag and local gradient.

Run in conjunction with other nuclear logging services using cased-hole equipment, the Cemeton is re-

corded as the instrument goes into the hole at approximately 100 ft. per minute on the same run used for regular nuclear logging on the way out.

The technique is also used to determine the effectiveness of the primary cement job and to check squeeze jobs. It double checks the location of casing collars and shows casing seats, liner tops and changes in casing weights.

For further information write Lane-Wells Company, P.O. Box 1407, Houston 1, Texas.



Advances Improve Plastic Boats, Pipe

Polyethylene pipe with greater initial burst strength and durable new boats molded from epoxy glass fiber spray have been made possible by some major new developments.

A new spray gun produced by A. Gusmer, Inc. has overcome the problem of short pot life of fast curing epoxy resin-hardener systems. In the spray gun the correct proportions of resins and hardener are assured through a positive metering system. These materials meet in the gun's mixing chamber where they are mixed and forced through an orifice under pressure of 300 psi. to be sprayed into the boat mold.

The new polyethylene compound for pipe was developed after tests proved that instantaneous burst strength in pipe is proportional to the density of the resin.

A resin was developed with a high density of .930 and a low melt index of 1.2, and the resulting pipe compound was designated DHD-4022. Additional major strength advantages include increased resistance to environmental stress cracking, exceptional corrosion resistance and light weight.

For further information write Industrial Public Relations, Ltd., 655 Madison Avenue, New York 21, N. Y.

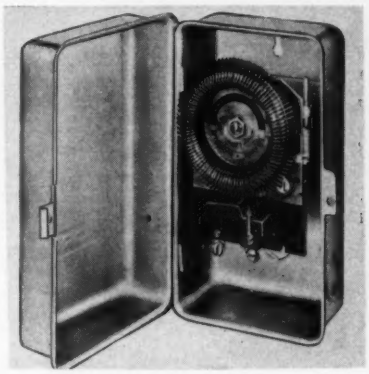
Switch with random start . . .

Protects Pumping Units

A program time switch with a built in random start provides undervoltage protection for oil field pumping equipment.

The Model 8005 prevents any two pumps in an oil field from coming on at the same time and protects equipment and wiring against overload of initial surge current.

In an ordinary time switch when power is restored, all pumps start up at the same time, and the overload may cause another outage. With the new time switch, however, a built-in time delay start contact makes it impossible for any two to close at the same time.



The time delay start can be operated manually without disturbing automatic settings. **For further information write Tork Time Controls, Inc., Mount Vernon, New York.**

Chris-Craft Has New V-8 Marine Engine

A new V-8 marine engine which develops 208 gross hp, 185 shaft hp at 4000 rpm has been developed by the Chris-Craft Marine Engine Research, Development and Test Center in Algonac, Michigan.

Regular, non-premium grade fuels may be burned in the new Model "283" which has a four-barrel downdraft carburetor. The compact Model 283 V-8 has 283 cu. in. piston displacement and a compression ratio of 8.00:1. Weight of the engine is 665 lbs., and its dimensions are 39¼ in. by 27⅜ in. by 21 17/32 in.

For further information write Chris-Craft Corporation, Pompano Beach, Florida.

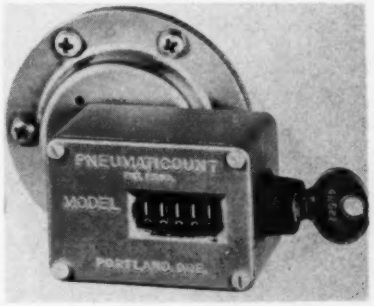
New Subsurface Pump Built for Slim Holes

Safe economical methods for producing low volume wells are possible through a new subsurface pump with a ⅞-in. bore designed for slim hole completions and stripper production.

The pump which was developed by Axelson Manufacturing Company, Division of U. S. Industries, Inc., is rated for a 6000 ft. maximum depth. It features a chrome-plated box end plunger, Axloy balls and seats, and top and bottom cup hold-downs.

The largest diameter of the pump is 1.260 in. The drift diameter of the 1¼-in. non-upset tubing is 1.286 in.

For further information write U. S. Industries, Inc., 5947 Shelia Street, Los Angeles 22, California.



Pneumatic Counters Built for LACT Units

A new line of highly accurate automatic counting devices controlled by pneumatic action are especially adaptable as metering devices for automatic lease custody transfer units.

The counters screw into the line controlling the air cylinder and can be completely installed in five minutes. There is no linkage to assemble or get out of adjustment, no solenoid and no possibility of half or miscounts.

Particularly adapted for field use, with tamper-proof key reset and weather proof cases, the Pneumaticount will outwear and outperform mechanical counters, yet sells for a total cost of less than the usual installation cost. **For further information write Pneumaticount, 3400 N.E. 54th Avenue, Portland, Oregon.**

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New Oil Tool Company Begins Production at Houston

A new tool company manufacturing high speed oil field milling tools and other drilling equipment has begun production at Houston.

A-Z International Tool Company uses "Zitco," an especially developed tungsten carbide cutting material, to cut hard facing material on junk and casing mills of patented design.

Sanford

Chadderdon

Jack Chadderdon, former head of operations for Servco Corporation at Houston, has been named president of A-Z International, and Larry Sanford, former general manager for Servco covering the Gulf Coast and Mid-continent areas, is vice president.

The new firm is represented by A-Z Export, S.A. in Venezuela and in other export areas by the International Tool and Supply Company.

Veteran Lawyer Hugh Q. Buck Named Acting HOMCO Chief

Hugh Q. Buck of Houston, general counsel of Houston Oil Field Material Company, Inc. for 17 years, has been named acting president of the company. George O'Leary, founder and president of the 30-year-old oil field supply and service firm died suddenly in December.

Buck

Buck, who is partner in the Houston law firm of Fulbright, Crooker, Freeman, Bates and Jaworski, will serve as acting president until a new president is appointed.

He graduated from the University of Texas in 1933 and completed graduate work at George Washington University in Washington, D. C., after which he served as counsel for the Reconstruction Finance Corporation and later for Maryland Casualty Company in Baltimore. He was named general counsel for HOMCO in the early 1940's.

American Bridge Names Two New Contracting Managers

Walter Schielke, top official in Houston for American Bridge Division of United States Steel Corporation, and J. H. Long, his predecessor at Houston, have been appointed regional contracting managers.

Schielke will supervise American Bridge district contracting offices in the southern area with headquarters at Houston. Long will supervise similar offices at New York, Baltimore, Boston, Philadelphia, Elmira and Trenton.

L. R. Thomas has been appointed plant manager of the Orange, Texas, plant for American Bridge succeeding G. L. Martin, who has been moved to vice president-operations at American Bridge headquarters in Pittsburgh, Pennsylvania.

Thomas, a civil engineering graduate of the University of Alabama, joined American Bridge at Birmingham, Alabama, in 1940. Martin was named manager of the Orange plant in 1955.

Mid-Continent Supply Names Tarwater New Vice President

T. P. Tarwater has been elected vice president for Mid-Continent Supply Company of Fort Worth. R. C. Holden and W. S. Jones were promoted to key positions.

Tarwater

Tarwater has been with Mid-Continent since he joined the company's field store in Kermit in 1936. He will have charge of Mid-Continent sales operations in West Texas, New Mexico and the Rocky Mountain areas.

Holden, who joined Mid-Continent in 1948, has been named assistant manager of the Tulsa Division. Jones was promoted from assistant manager of the used equipment department to manager of that department.

Reed Roller Bit Announces Five Major Staff Changes

Reed Roller Bit Company, Houston, has appointed five top officials to new appointments in a company expansion move.

J. A. Grundy, former vice president —manufacturing, has been appointed operating vice president of the company.

Wiley B. Noble, formerly head of

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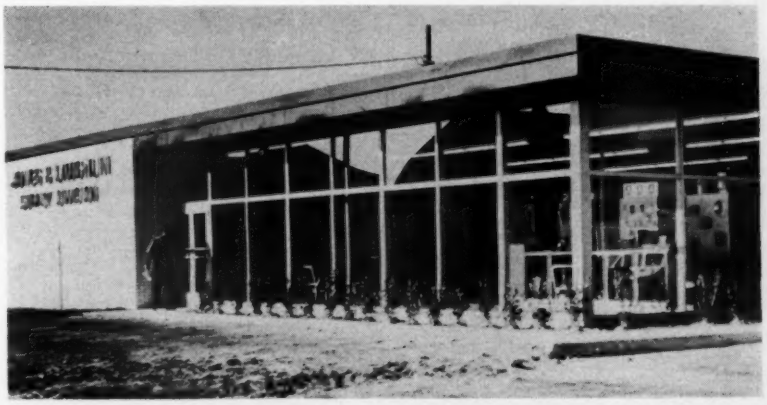

NEW STORE-OFFICE building at Shreveport, Louisiana, houses Jones & Laughim Supply Division's North Louisiana-Arkansas district sales office and Shreveport oilfield supply store. The modern building of steel and masonry construction also houses a warehouse and complete pump shop.

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Service Personalities . . .

(continued from preceding page)

engineering, has been named vice president.

G. J. Gilbert, former assistant chief engineer, has been appointed chief engineer.

R. G. Stockton, formerly purchasing agent, is new materials manager.

T. B. Ellis, formerly chief industrial engineer, has been promoted to the position of factory manager.

Waukesha Promotes Gray To Job of Chief Draftsman

Sam F. Gray has been promoted to chief draftsman of the Engine Division of Waukesha Motor Company, it was announced by James E. Delong, president.

Gray

Gray has been with Waukasha for 18 years and has extensive experience in both design and experimental testing of internal combustion engines.

He was graduated from Iowa State College in 1939 with a degree in mechanical engineering. He is a member of the professional engineers of Wisconsin.

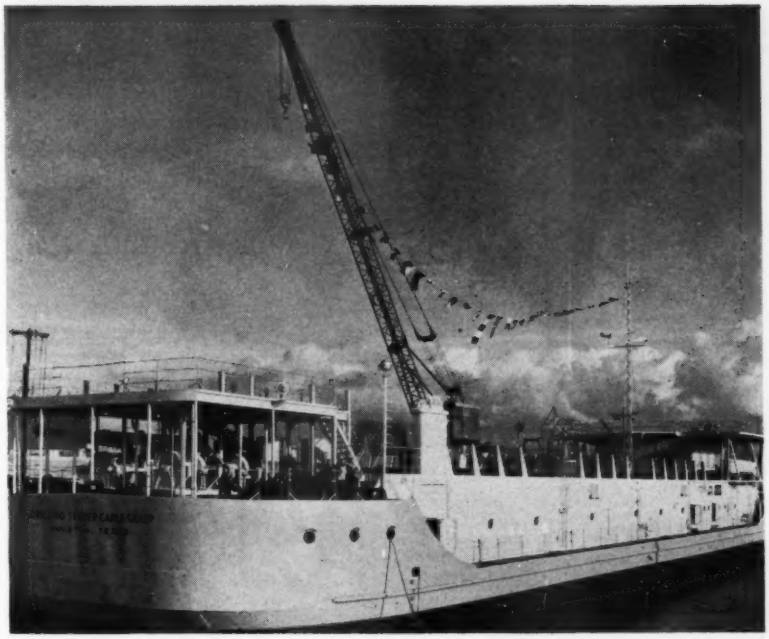
Pearson Named Sales Official At Houston for Atlas Pipe Inc.

W. T. "Tom" Pearson has joined Atlas Pipe Inc., as salesman in the Houston office, according to W. H. "Buster" Becker, president.

Pearson

Previous to joining Atlas Pipe, Pearson was district sales manager in Houston for Lone Star Steel Company. He has held positions as purchasing agent, and as salesman with other firms in Houston. He is a member of the American Petroleum Institute.

Pearson attended Texas A&M and served four years as a pilot in the Air Force during World War II.



CARL E. SHARPE, veteran tender, serviced the platform in Ship Shoal Block 199 from which the CATC Group completed a dual oil discovery in 101 ft. of water.

CATC Gets Dual Oil Strike

Wildcat drilled in 101-ft. water in Ship Shoal completed in two zones for 612 bbls. per day

An oil discovery completed in two zones in the Gulf of Mexico flowed a total of 612 bbls. per day for the CATC Group.

Located in Ship Shoal Block 199, Terrebonne Parish, Louisiana, the well was completed at a total depth of 12,914 ft. in 101 ft. of water. Tests on the well, No. A-1, showed a net pay in 21 sands of 181 ft. of gas distillate, 213 ft. of gas and 68 ft. of oil in two zones between 5,500 and 12,000 ft.

The zone from 9,901 ft. and 9,906 ft. flowed at a rate of 231 bbls. per day on a 10/64-in. choke while the zone from 9,981 to 9,986 ft. flowed at 291 bbls. per day on a 10/64-in. choke.

The CATC Group, Continental Oil Company, Atlantic Refining Company, Tidewater Oil Company and Cities Service Production Company, has two blocks totaling 10,000 acres in the area of the discovery well. Nearest production is nine mi. northeast of the discovery.

Placid Records Gas Discovery In Eugene Island Block 199

A new discovery in Block 199, Eugene Island area, Gulf or Mexico, has been completed as a gasser by Placid Oil Company.

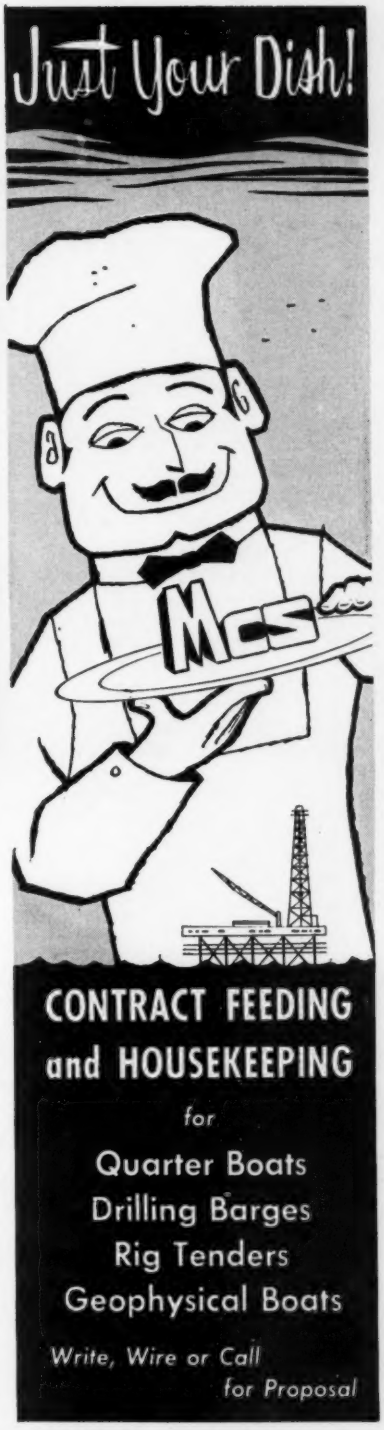
The well, No. 1 OCS-0436, was completed flowing 3,720,000 cubic ft. of gas plus 151 bbls. of 44.6-gravity condensate per day through 12/64-in. choke under 4500 lbs. tubing pressure. Gas-condensate ratio was 43,781 to one.

Drilled to 14,310 ft. and cased with 7-in. pipe to 13,762 ft., production is from perforations at 13,506-534 ft.

Gulf Finds Two New Sands In West Delta Confirmation

Two new pay zones were opened when Gulf Oil Corporation completed No. 2 Louisiana State "PP" 192 as a dual oil producer, confirm-

(continued on next page)



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(continued from preceding page)

ing production of the West Delta Block 25 field.

Perforations at 10,122-137 ft. yielded 446.48 bbls. of 30.9-gravity crude per day on 9/64-in. choke. Tubing pressure registered 2850 pounds with gas-oil ratio measuring 632 to 1. Flow at the 8039-46 ft. interval was 242.52 bbls. of 26.5-gravity oil per day on a 10/64-in. choke under 1350 pounds tubing pressure. Gas-oil ratio measured 395 to 1.

The confirmation well is approximately 3/4 mi. east of the discovery well.

Continental Hits New Oil Pay In West Delta Block 83 Well

Continental Oil Company has tapped a new oil sand in West Delta Block 83 field off Plaquemines Parish, Louisiana.

The well, No. 26 State Lease 978, Block 53, flowed 193 bbls. of oil per day from the new sand through perforations at 10,086-089 ft.

The second phase of the dual completion was from regular field pay through perforations 10,160-166 ft. which flowed 202 bbls. oil per day.

Seven-inch casing was run to the bottom of the 10,336-ft. well.

New Gas-Condensate Zone Opened In Main Pass Area

New gas-condensate production has been opened by Gulf Oil Corporation in the Main Pass area, Plaquemines Parish, Louisiana.

The well, No. 1 Louisiana State "QQ" 195, Block 47, flowed 1,310,000 cubic ft., of gas and 16 bbls. of 57.4-gravity condensate per day through 10/64-in. choke with 2350 pounds tubing pressure. Perforations are at 8454-58 ft. in the 9000-ft. well.

"IF THERE'S ANY FURTHER CALLING IN FOR A CREW BOAT, I'LL DO IT!"

Expensive Cay Sal Wildcat Drilling Below 15,000 Ft.

A wildcat to determine whether a remote underwater region of the Caribbean is an oil province recently drilled past its 15,000-ft. schedule.

Nearly $3 million was budgeted for the test which Bahama California Oil Company and Bahamas Gulf Oil Company began in the spring.

Site of the effort is 40 mi. northeast of Cardenas on Cuba's north coast and 187 mi. southwest of Nassau. It is about 150 mi. south of Miami.

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KING-SIZED mobile offshore platform, GEORGE F. FERRIS, barely clears the Golden Gate Bridge as it heads for Los Angeles where it will assemble the record-size ocean sewer pipe in 200 ft. of water.

Largest Mobile Unit

New DeLong platform has 275-ft. legs, will be converted to offshore drilling after completing deep sewer line

When the world's largest mobile offshore platform took to sea recently it was to lay the largest and deepest pipeline ever pieced together under water.

The **George F. Ferris,** built by Pacific Coast Engineering Company, Alameda, California, and named after the president of Raymond International, Inc., is designed to be used eventually for offshore oil drilling operations in water up to 200 ft. deep.

In the meantime, the 4500-ton platform equipped with 275-ft. legs, will be engaged in laying a $20 million offshore pipeline for the Los Angeles Hyperion sewage plant.

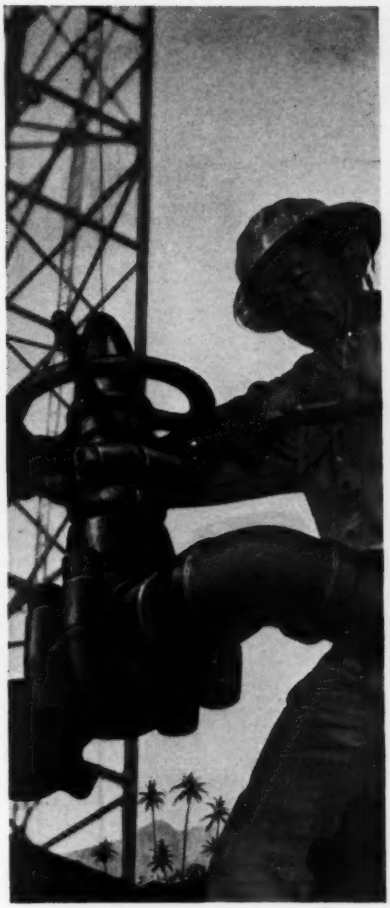
At its first location the **George F. Ferris** will jack down its legs on the ocean floor and begin laying six miles of offshore sewer pipe in water up to 200 feet deep, a feat never before attempted. Large enough to accommodate two men, one standing on top of the other, the 12-foot diameter pipe weighs almost four tons per linear foot.

The sewer pipe job is being handled by Hyperion Constructors, a joint venture of six well-known construction firms. They are the DeLong Corp., New York; Healy Tibbits Construction Co., San Francisco; Peter Kiewit Sons' Co., Omaha; Macco Corp., Paramount, Calif.; Raymond International Inc. (formerly Raymond Concrete Pile Co.), New York; and Tavares Construction Co., La Jolla, Calif. The contract is with the Board of Public Works, City of Los Angeles.

Getting the mammoth rig out of San Francisco Bay was tricky. Its four 275-ft. high legs had to be jacked to full height to permit the rig to be towed through shallow water from a dock in Richmond, where the legs were erected.

Once at sea, the platform made its final leg adjustment. The 25-story-

(continued on page 53)



Making Mud Behave

Drilling mud can destroy an ordinary valve. Control of the highly abrasive, pulsating pressure in mud lines was a constant bother until Cameron perfected the Flex-Seal Mud Valve some twenty years ago. This design was an instant success. Today the same valve with certain innovations is saving time and money on almost every drilling rig in the world. New parts interchangeable with the original design make the Flex-Seal rigid during repair and extend its already remarkable resistance to wear.

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Oil Man's Calendar

FEBRUARY
1959

9-11 AAPG Rocky Mountain Section, 9th annual meeting, Civic Auditorium, Albuquerque.
15-19 AIME, annual meeting, Sir Francis Drake Hotel, San Francisco.
16-17 Petroleum Packaging Committee, meeting Goodhue Hotel, Port Arthur.
16-19 AAPG-SEPM, 44th annual meeting, Memorial Auditorium, Dallas.
26-27 API Division of Marketing, Lubrication Committee meeting, Sheraton-Cadillac Hotel, Detroit.

MARCH

1- 5 ASME, gas turbine power conference and exhibit, Netherlands-Hilton Hotel, Cincinnati.
8-12 ASME, aviation conference, Statler Hotel, Los Angeles.
9-11 Midwest Gas Association annual meeting, Hotel Fort Des Moines, Des Moines.
19-20 New England Gas Association, annual meeting, Hotel Statler, Boston.
25-27 API Division of Production, southern district meeting, Roosevelt Hotel, New Orleans.

APRIL

2- 3 Society of Petroleum Engineers of AIME, Rocky Mountain petroleum section, 5th annual joint meeting, Casper, Wyo., site unreported.
5-10 ASME nuclear congress, Cleveland Auditorium, Cleveland.
8-10 API Division of Production, eastern district meeting, Penn-Sheraton Hotel, Pittsburgh.
13-17 29th Annual Safety Convention and Exposition, Hotel Statler, New York City.
14 Independent Oil Men's Assn. of New England, annual meeting, Hotel Statler, Boston.
15-17 API Division of Transportation, annual tanker conference, Jung Hotel, New Orleans.
15-17 National Petroleum Association, semi-annual meeting, Hotel Cleveland, Cleveland.
19-23 ASME, oil and gas power conference and exhibit, Shamrock-Hilton Hotel, Houston.
22-24 API Division of Production, mid-continent district meeting, Herring Hotel, Amarillo.

30-MAY

1 API Division of Production, Pacific coast district meeting, Biltmore Hotel, Los Angeles.

MAY

3- 6 LPGA, annual meeting, Conrad Hilton Hotel, Chicago.
4- 6 API Division of Marketing, Lubrication Committee meeting, San Marcos Hotel, Chandler, Ariz.
4- 7 American Geophysical Union, annual meeting, Washington, site unreported.
4- 8 API Safety & Fire Protection Committees, 12th midyear meeting, Rice Hotel, Houston.
6- 8 API Division of Production, Rocky Mountain district meeting, Gladstone, Henning and Townsend hotels, Casper, Wyo.
7- 8 Society of Petroleum Engineers of AIME, Permian Basin oil recovery conference, Midland, Texas, site unreported.
13-15 API Division of Transportation, annual pipe line conference, City and site unreported.
15-24 International Petroleum Exposition, Tulsa.
27-29 API Division of Marketing, midyear meeting, The Savery, Des Moines.
27-29 API Division of Finance & Accounting, midyear meeting, Hotel Statler, Los Angeles.
27-30 API Division of Refining, midyear meeting, Statler Hotel, New York City.

31-JUNE

6 Fifth World Petroleum Congress, The Coliseum, New York City.

JUNE

1- 5 Fifth World Petroleum Congress Exposition, The Coliseum, New York City.
21-26 Air Pollution Control Association, annual meeting, Hotel Statler, Los Angeles.
22-23 Michigan Gas Association, meeting, Grand Hotel, Mackinac Island.
22-24 Canadian Gas Association, annual meeting, Empress Hotel, Victoria, B. C.

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(continued from page 51)

high stilts were lowered until 371½ feet dragged underneath the hull, providing adequate navigational stability. Legs can be jacked up or down at a speed of about 40 feet per hour.

Operation of the new platform is unique. It will lower 600-ton assembled sections of pipe to the ocean floor, connect with previously laid sections, and then backfill around them with a cradle of gravel. After each 192-ft. long pipe section is laid, the rig "walks" ahead by first jacking down its platform on the legs until the entire unit is floating. Then it winches itself ahead to the next pipe position, lowers its legs and lifts itself above the reach of waves to repeat the unusual pipe-laying sequence.

Never before has the self-elevating principle been attempted at such a great depth of water, or on a device requiring so many separate jacking operations. To lay the 32,000 feet of offshore pipe, the **George F. Ferris** will be jacked up and down at least 170 times. Pipe alignment, jointing and backfilling will be monitored by closed-circuit underwater television.

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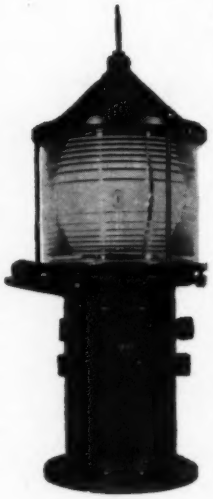

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A roughneck in Africa wandered away from the rig and was captured by cannibals. Each day his arm was cut by a dagger and the natives would drink his blood. Finally one day he called the king. "You can kill me and eat me if you want to," he said, "but I'm tired of being stuck for the drinks."

Mummies: Egyptians who were pressed for time.

The absent-minded professor and his absent-minded wife were spending a quiet evening at home when someone banged on the door. She yelled, "O my goodness, it's my husband!" and he jumped through the window.

A president of an oil company asked his little son what he wanted for his birthday.

"A baby brother," the little boy replied.

The father, being well versed in engineering, objected to the suggestion in a mild way by saying, "But it's only ten days before your birthday, and that does not give me enough time."

"I know," the little boy said. "But can't you put more men on the job?"

A stingy husband, while out of town, sent his wife as a present, a check for a million kisses. The wife, a little annoyed, sent back a post card: "Dear Jim, thanks for the birthday check. The milkman cashed it for me this morning."

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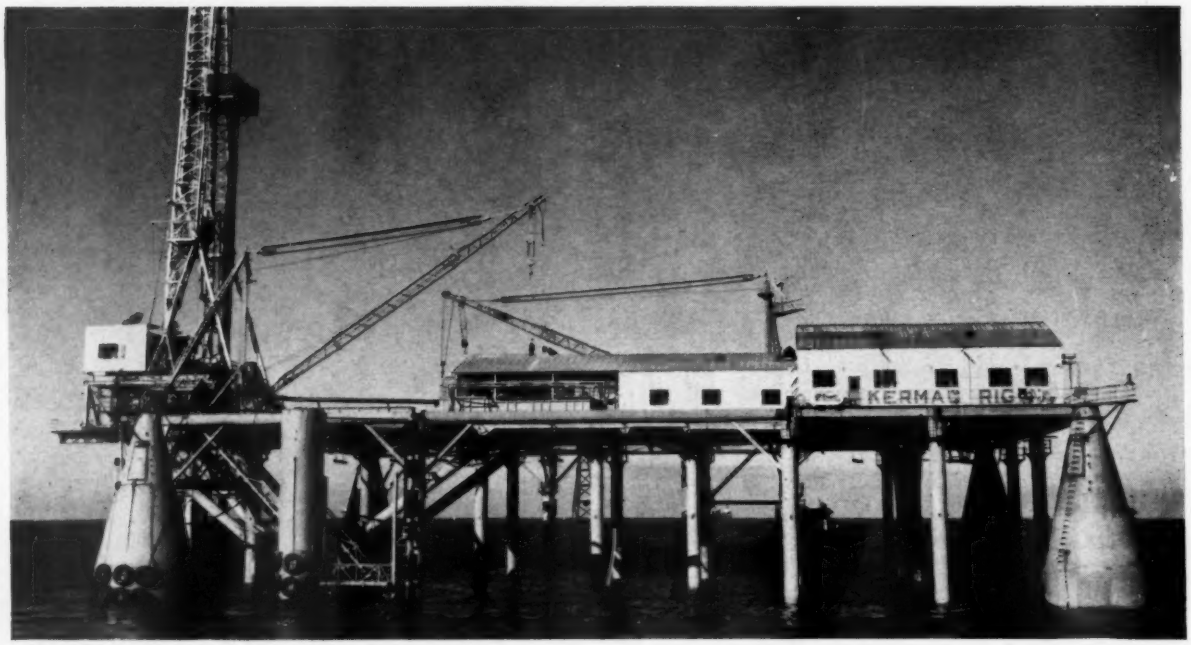


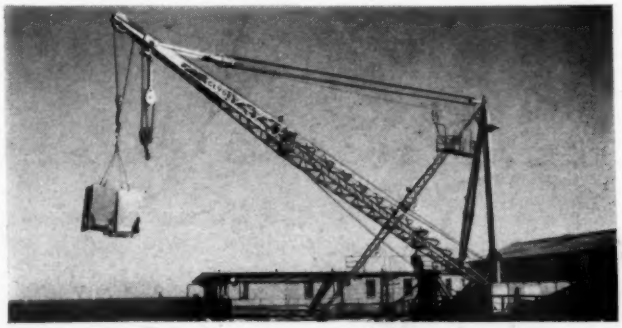
CLYDE DERRICKS and CLYDE HOISTS SERVE ON MASSIVE KERMAC RIG 47

Kerr-McGee Oil Industries, Inc. new Rig No. 47 is pictured above on location for Phillips Petroleum Company. Measuring 202 feet wide by 242 feet long, the new rig offers offshore platform space to spare with a maximum in stability. Built recently at Orange, Texas, Rig 47 was towed in two sections down the Sabine River and assembled at Sabine Pass before outfitting.

Materials handling equipment on this huge drilling rig had to meet tough specifications for reach, capacity and round-the-clock endurance. Two stiff-leg Clyde derricks operating with Clyde electric hoists and swingers proved the answer. These derricks with 100-foot booms are positioned to serve the full area of the giant Texas deck. The hoists are powered by the rig's main diesel generators.

Although the installation and service on drilling rigs are highly specialized, the Clyde equipment that was furnished on Rig 47 is standard equipment. This not only made possible substantial savings in design and construction costs, but also gave the strongest possible assurance of getting performance tested machinery. The all-welded booms and stiff-legs, rigid steel hoist frames and ball bearing shafts are but a few of the many Clyde quality features "right out of the catalog".

If dependable materials handling in any bulk or form is a problem that concerns you, check with Clyde. Find out why Clyde equipment pays *you* best.



CLYDE DERRICK BOOSTS MUD CANS FROM BOAT TO TOPSIDE. With 100-foot booms, the Clyde derrick on No. 47 reaches the extreme non-drilling end of the giant deck. At right, bulk mud cans are being unloaded from Kermac Work Boat III, anchored alongside rig.

For offshore, for ship or shore, Consult Clyde Marine Engineering Department

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